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Vol. I.—14TH YEAR.

SYDNEY: SATURDAY, APRIL 9, 1927.

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MEDICAL APPOINTMENTS VACANT, ETC.

MEDICAL APPOINTMENTS: IMPORTANT NOTICE

DIARY FOR THE MONTH

EDITORIAL NOTICES

An Address.¹

By E. BRETtingham MOORE, M.B., Ch.M. (Sydney),
Retiring President of the Tasmanian Branch
of the British Medical Association.

I SHALL begin by thanking you for the honour you have done me during the past year when you were kind enough to appoint me your President. In relinquishing office to my friend, Dr. Hogg, I do so with great pleasure, as I feel that he will far more ably than I be able to further the interests of the Branch.

It is with extreme diffidence that I made a choice of the subject on which to deliver my Presidential Address and I hope you will bear with my few remarks on a subject which, though not strictly medical, yet bears so many points of interest from an anatomical and physiological aspect that I trust I may be forgiven. The title "*Kuatsu*" is no doubt unfamiliar to most of you and is the designation of the Japanese method of restoring consciousness after an attack on one of the important nerve centres. As you will see, it has a direct application

to many accidents following blows, electric shocks *et cetera* and has a peculiar interest owing to the practical manner of the application of a very sound and indeed extensive knowledge of anatomical details from a very remote perusal of the history of an uncivilized people certainly many hundreds of years ago. How this knowledge was attained I cannot even guess.

Before I pass on to a description of some of these methods of resuscitation, may I touch for a moment on the need for their elaboration. As you all know *jiu-jitsu* is a very highly specialized form of attack and defence and apart from purely wrestling devices certain blows are employed which will cause unconsciousness and death. In devising these blows a most ingenious application of mechanics is combined with an accurate knowledge of the situation of large nerve centres especially of sympathetic ganglia and of other important structures. For instance from the mechanical aspect the blow is delivered with the point of the elbow, the extended knuckle or the ulnar edge of the hand, thus applying a much greater force at a desired point than a blow from the closed fist. A small experiment with the edge of the hand over the cricoid cartilage for example will convince the most sceptical of the extreme sensitiveness of certain areas.

¹ Delivered at the Annual Meeting of the Tasmanian Branch of the British Medical Association on February 12, 1927.

I will now pass on to a few of the manœuvres used in *Kuatsu*.

Manœuvre I. is for a person rendered unconscious by a blow over one of the nerve centres or important viscera.

Firstly, make the patient lie on his back with arms widely extended. Kneel at his right hip and grasp the right shoulder with the left hand. Bend over the patient, resting the back of the right hand in the pit of the stomach. Secondly, dropping the elbow, push the back of the hand sharply in the direction of the diaphragm repeating the motion forcibly about twenty times a minute. Thirdly, as soon as the patient revives, sit him up with arms extended and rotate them in turn (or if you have an assistant, simultaneously) in wide circles, passing upwards in front. It will be seen how closely this follows the modern recognized principles. The next manœuvres, however, are far more novel. I cannot vouch for their efficacy, but my old instructor, Ryogoro Fukushima, had great faith in them.

Manœuvre II. is for more serious injuries from blows, strangulation or shock. Firstly, make the patient lie on his face with the arms widely extended and kneel at his left side near the hip. His face should be turned to the side. Secondly, strike sharply with the heel of the hand a glancing blow upwards and forwards at the seventh cervical vertebra repeating about sixty times a minutes. Regularity is very important. Thirdly, as soon as consciousness returns, make the patient sit up and promote the circulation and respiration as in Manœuvre I. If this is neglected the patient may relapse.

Manœuvre III. is for cases in which the lower abdominal viscera or testicles have been the object of attack or injury. Firstly, make the patient lie as described in the previous manœuvre and direct the blows from the heel of the hand, in this case at the level of the fourth lumbar vertebra. Secondly, proceed as in Manœuvre II.

In case of failure in the above manœuvres a more severe stimulus may be applied to these localities by sitting the patient up and supporting him by the axillæ and using the knuckle of the middle finger or more powerfully still the knee. This latter I should be very chary of trying.

Manœuvre IV. is used in injuries of the brain; the cervical plexus is stimulated in the following way. Kneeling behind the patient who is sitting with legs outstretched, press the finger tips on the side of the neck where it joins the shoulder line and smartly turn the hand forward, striking the clavicle with the knuckles; repeat this regularly and quickly. This is followed by finger tip kneading of the deep muscles of the neck below and behind the ear and then over the temple.

From the above it will be seen what close attention has been paid throughout to the situation of the large nerve centres and the practical application of the system to these areas is little short of marvellous in a race which knew nothing, so far as we know, of dissections of the *cadaver*.

Has this knowledge been handed down from an earlier civilization or is it merely empirical?

I hope I have succeeded in interesting you for a few minutes and will now ask Dr. Hogg to take my place for the ensuing twelve months.

THE INTERPRETATION AND CLINICAL SIGNIFICANCE OF CERTAIN ELECTRO-CARDIOGRAMS.¹

By ERIC F. GARTELL, M.B., B.S. (Adelaide),
M.R.C.P. (London),
Adelaide.

THIS evening I wish to stimulate your interest in an instrument which not only is of paramount importance in cardiac research work, but also is a valuable aid to the clinician who desires to base his diagnosis, treatment and prognosis on a complete examination of his patient.

In passing by the first sphere of action I would draw your attention to the fact that it is this research work that has enabled us to understand and interpret many clinical findings which previously were of little significance because of our ignorance of the underlying mechanism. In this respect I have merely to mention the field of arrhythmia and more especially the demonstration by Lewis of circus movement in auricular fibrillation and flutter, this discovery being directly dependent upon electro-cardiographic investigation.

Tonight it is to you as clinicians that I would speak.

The Physiological Foundation.

In physiology we were taught that if a strip of muscle were stimulated at one end a wave of contraction would pass along it and that this wave would be preceded by an alteration of electric potential, contracting muscle being negative. This electrical wave which is known as the wave of excitation, is evidence of the functional activity of the muscle. A heart is composed of many such strips superimposed and interlaced. Therefore it would seem possible to recognize contraction in any strip of the myocardium by recording its excitation wave and, moreover, by analysing the waves from the whole heart, to demonstrate the functional activity of its component muscular strips. Unfortunately this is not feasible to more than a limited degree owing to the intricate interlacing of the myocardial fibres. However, even this limited scope is of great importance, for it demonstrates the functional activity of certain parts of the heart muscle. This, then, is the value of the electrocardiograph, for abnormal tracings show abnormal muscular action just as abnormal sounds indicate the condition of the valves.

Technique and Apparatus.

The action current of the heart was first recognized in 1856 by the use of leads attached to the heart wall. In 1887 Waller led the current from the body surface and took a tracing from the human

¹ Read at a meeting of the South Australian Branch of the British Medical Association on October 28, 1926.

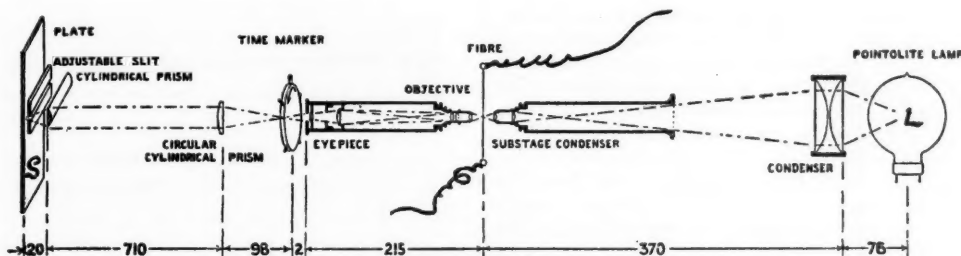


FIGURE I.
Showing Diagram of Electrocardiograph.

heart by means of a capillary electrometer. This apparatus was replaced in 1904 by Einthoven's string galvanometer, a modification of which is embodied in the modern electrocardiograph. Examination with this instrument is perfectly comfortable for the patient who merely sits in a chair resting both hands and also the left foot in bowls of warm saline solution. From these wires run to a switch on the control board by means of which the cardiac current may be conducted by any desired lead, for example, Lead 1, from the right arm and left arm; Lead 2, from the left arm and left leg; Lead 3, from the right arm and left leg. By means of the switch the current is thrown through a very fine quartz fibre. This fibre is suspended between the poles of an electromagnet and therefore deviates towards one or other pole according to the direction of the current flowing through it. That is to say, each time the heart contracts the fibre kicks to and fro between the poles.

This movement is recorded photographically.

At L in the accompanying diagram (see Figure I.) there is a lantern from which the light passes through condensers to focus on the vibrating fibre. By a further series of lenses the shadow of the fibre is magnified and thrown on a screen S. Behind the screen is a camera plate which, when released, steadily descends at any desired speed. When all is ready a slit in the screen is opened and the plate is released so that the shadow of the vibrating fibre is focussed on the moving plate whereon it imprints the curve. This process is repeated, a different slit being used for each lead, so that all three leads are recorded on the same plate.

The speed is recorded by interposing between the ocular and the screen a toothed disc which cuts the beam of light every one twenty-fifth of a second, so ruling a horizontal line. Other time markers record fifths of seconds.

The record is standardized for comparing it with other records by adjusting the tension of the fibre until it is displaced ten millimetres when a current of one millivolt is thrown into circuit.

When the plate is developed one possesses a permanent record of great accuracy, depicting the condition of the heart muscle.

Electrocardiograms.

As time is pressing I will outline a few of the main features of the normal electrocardiogram (see

Figure II.) and then show a few lantern slides showing tracings taken from patients with abnormal cardiac conditions.

In Figure II. are seen the curves corresponding to Leads 1, 2 and 3, and consisting of recurring groups of deflections named P, Q, R, S, T and U. The P wave which is upright, small and rounded, is evidence of auricular contraction, while Q, R, S and T denote ventricular systole. U is a wave which rarely appears and is of little clinical significance.

Normally the P waves are equidistant, but this distance is sometimes subject to slight variations, this condition being termed sinus arrhythmia (see Figure II.).

During the Q, R, S period the excitation wave is spreading over the ventricles, a process requiring not more than one-tenth of a second.

Q is small and steep. R, the largest deflection, is a tall, sharp spike. S also is steep and sharp. T is broad and prominent terminating at the end of ventricular systole.

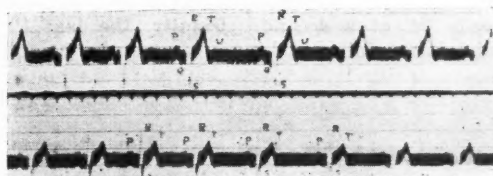


FIGURE II.
Showing Normal Rhythm with Sinus Arrhythmia.

There are three iso-electric periods, one following the auricular wave, P, one between S and T when all the ventricular fibres are in contraction, and the third during ventricular diastole. In the following curves some of the important points will be stressed.

I show another slide which depicts a preponderance of the right ventricle over the left. Here the S wave in Lead 1 or S_1 and R_3 are taller than normal, while R_1 and S_3 are very short.

In yet another slide the reverse obtains, for R_1 and S_3 are the tallest waves, that is to say, there is left ventricular preponderance.

In Figure III. also R_1 and S_3 are tall, but in addition the QRS complex is notched and broader than normal, while in each lead the T wave is opposite in direction to the main deflection. Therefore there is left-sided preponderance accompanied by

delayed and abnormal conduction of the excitation wave through the ventricles. This condition is due to a block in the right main branch of the bundle of His. The impulse reaches the left ventricle first by its normal path, hence the preponderance and then diffuses slowly through the ventricular muscle to bring about the contraction of the right ventricle. Hence the abnormal QRS complex. Incidentally premature contractions of left ventricular origin are shown by a QRST complex very similar to those in this record.

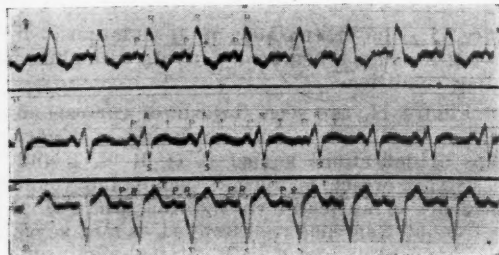


FIGURE III.
Showing Right Bundle Branch Lesion.

I also show a slide which is just the reverse and shows a left bundle branch lesion. In addition it shows auricular fibrillation, small deflections fff replacing the P waves, while the ventricular complexes occur at irregular intervals.

Figure IV. shows partial heart block. Normally the P-R interval, that is, the time taken for the stimulus to pass from the sino-auricular node to the ventricle, is not more than 0.18 of a second, but here it gradually increases in length until it greatly exceeds 0.2 of a second. Finally, the last P in Lead 1 is not followed by any ventricular complex.

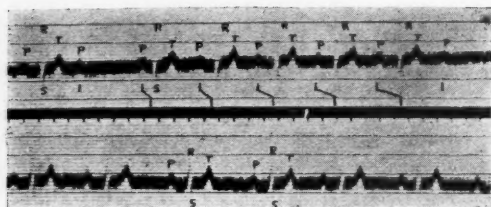


FIGURE IV.
Showing Partial Heart Block.

That is to say, the bundle of His has failed to convey the impulse from auricle to ventricle.

This increased P-R interval shows the first stage of heart block and this electrocardiographic evidence may be the first indication of a myocarditis.

Figure V. shows partial heart block complicated by sino-auricular block in which condition an omission of a cardiac cycle occurs at intervals. Therefore the distance between the last two P waves in Lead 1 is double the normal interval.

Figure VI. shows complete heart block. Both the auricular and the ventricular rhythms are regu-

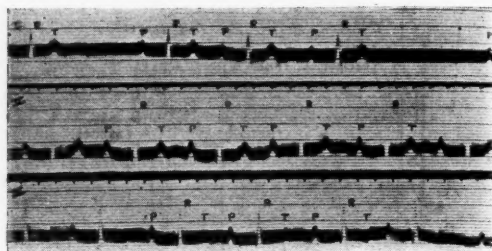


FIGURE V.
Showing Partial Heart Block and Sinoauricular Block.

lar, but their rates are quite independent of one another.

Another slide shows a series of auricular extrasystoles. The P wave is inverted because the impulse has arisen at some point other than the sino-auricular node. The form of any wave depends upon: (i.) The site of origin of the stimulus, (ii.) the path by which it travels. Therefore all ectopic beats are indicated by abnormal waves.

Figure VII. is from a patient suffering from a 2:1 auricular flutter. In Leads 2 and 3 the P waves are represented by a regular series of continuous undulations at high speed, the auricle beat-



FIGURE VI.
Showing Complete Heart Block.

ing at 200 to 380 times per minute in flutter. To every second auricular beat the ventricle responds, so the Q, R, S and T waves are superimposed on the P waves.

Figure VIII. was taken from a patient suffering from mitral stenosis. Note the large P, often notched, which indicates auricular hypertrophy. There is right ventricular preponderance and T₂ and T₃ are inverted.

In Lead 3 is seen an auricular extra systole with a diphasic P.

Figure IX. is from a case of auricular fibrillation.

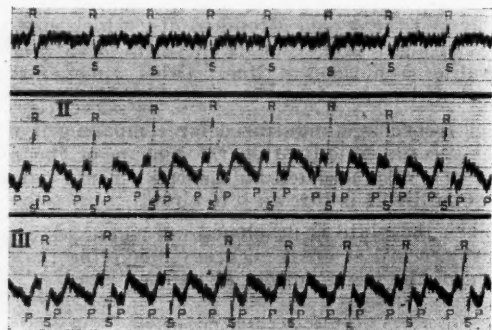


FIGURE VII.
Showing Auricular Flutter, 2:1 ratio.

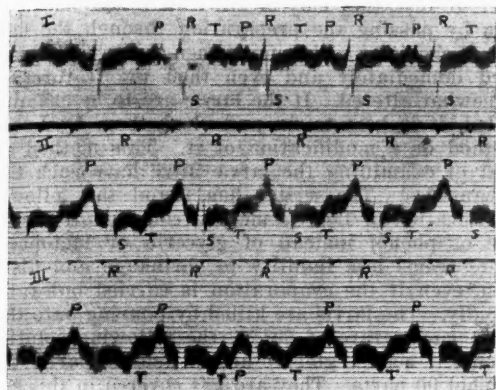


FIGURE VIII.
From a Case of Mitral Stenosis. Auricular Extrasystole in Lead 3.

In Figure X. the auricular fibrillation is complicated by an attack of paroxysmal tachycardia of ventricular origin preceded by a ventricular premature beat. Note the abnormal form of the waves.

I also show a slide from a case of true dextrocardia. The waves in Lead 1 are all inverted.

Summary.

1. Electrocardiographic investigation in no way distresses the patient.
2. It gives an accurate, standardized and permanent record of the condition of the heart muscle and conducting system.

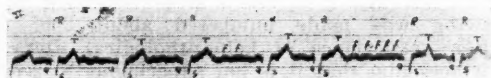


FIGURE IX.
Showing Auricular Fibrillation, fff Replacing P.

3. It demonstrates the site of origin of the stimulus causing each cardiac cycle and therefore is absolutely diagnostic in cases of irregularity and paroxysmal tachycardia. Indeed, some of these conditions cannot be diagnosed without this examination.

4. It shows whether sino-auricular, bundle or bundle branch block is present.

5. It is definite proof of the normal sequence of auricular and ventricular systoles in some and of the presence of independent ventricular beats or even rhythm in other cases.

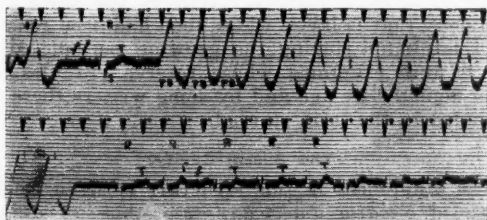


FIGURE X.
Showing Auricular Fibrillation and a Paroxysm of Tachycardia of Ventricular Origin.

6. It gives evidence of right or left ventricular preponderance and shows weakness or hypertrophy of the ventricular muscle.

7. Finally, in the case of cardiophobia where the physician can find nothing abnormal, a normal tracing is a source of valuable reassurance to doctor and patient alike. You will all concede that a cardiac examination without auscultation would be incomplete.

So with the electrocardiograph. To quote Pardee: "Like the sounds of the heart, electrocardiographic records must be carefully considered as an integral part of the whole clinical picture." Of course, this examination alone is not sufficient basis for a complete diagnosis, but it must be used in conjunction with the clinical findings and then it will frequently be found of very great service.

THE DIFFERENCES BETWEEN THE INFECTIVE LARVÆ OF THE HOOKWORMS OF MAN.

By G. M. HEYDON, M.B., D.P.H., D.T.M. & H.,
From the Australian Institute of Tropical Medicine,
Townsville.

Scope and Methods.

THE writer has referred elsewhere to the need in hookworm surveys and control work for a more practicable method of determining the prevalence and distribution of each of the two species proper to man. They are by no means of equal pathogenic importance. The only method hitherto available, that of worm counts, is so difficult to carry out in practice that it is of very limited value. It was suggested that a much better method is available, that of determining the species by an examination of the "mature" larvæ which may be obtained by culture of a part of the small faecal specimen ordinarily collected for examination for ova. The limitations of the method were pointed out; it determines, if the cultures are successful, which species is present in an individual or whether both are, but at present throws no light on their relative numbers, because the relative egg laying rates of the two worms is at present unknown and because in different cultures the ratio of mature larvæ obtained to eggs cultured in the case of one species bears no constant relation to that in the other.

The purpose of the present paper is to give details of the differences between the "mature" larvæ of *Necator americanus* and *Ancylostoma duodenale* and to show that some of them can be used to distinguish the genera with ease. The method is sufficiently simple and rapid to be of practical value.

It must be emphasized that only fully "mature" larvæ are dealt with throughout this paper, that is larvæ in which the changes which occur about the time of the second ecdysis, have been completed and in which the shed cuticle or sheath has been completely detached from the body and from the buccal rectal and excretory passages. It is much more convenient to work with these than with the earlier stages when the morphology is changing rapidly.

Several writers, Van Thiel, Cort, Svensson and Korke, have described differences between the mature larvæ of *Necator americanus* and those of species of the genus *Ancylostoma* although several others have reported that no reliable means of distinguishing them could be found. The paper of Stekhoven and Stekhoven-Meyer⁽¹⁾ has not been available. According to the summary in the *Tropical Diseases Bulletin* of December, 1924, they found differences, but none which made certain determination possible.

The mature larvæ obtained by culture with earth are isolated by the Baermann method or a modification of it. The following is very convenient and simple. Cylinders, open at both ends, are made from tins of suitable size by removing the lids and cutting off the bottoms. Over one end is stretched a piece of strong, closely woven cloth by means of a wire ring or the rim cut off from the lid. Clean sand is put into the tin to form a layer on the cloth, water run through to settle the sand and the culture then placed on top of it. This apparatus takes the place of the usual wire gauze and cloth and is immersed to a suitable depth in warm water, contained either in a funnel or in a petri dish; in the latter case the tin is rested on pieces of glass rod in the bottom of the dish. Larvæ are thus obtained in clean water.

For the cultures a quantity of earth was obtained and heated to destroy nematodes and this same sample was used throughout. The characters and composition of this earth were not especially inquired into; it was not clayey nor very rich in humus.

A very good way of making faecal cultures is to emulsify the faeces by shaking with water and a little gravel and to pour the whole onto dried earth. If the faeces are less thoroughly broken up, as usually happens when merely mixed with earth by means of a stick or spread on top of the earth, the development of many of the eggs, those in the interior of faecal masses, is delayed and at the end of a week it will often be found that many of the larvæ are still immature. Most of the cultures were made at room temperature in the Townsville summer, others in an incubator at 25° C.

The larvæ may be examined either alive or suitably fixed and cleared. The living larvæ are examined in water under a large coverslip ringed with vaseline. The thickness of the film should be just enough to avoid pressure on the larvæ. It is an advantage to have a bubble or two near the middle of the preparation; the larvæ tend to remain near it instead of seeking the margins. Nearly all the active living larvæ may be separated from dead and degenerated specimens and collected towards the centre of the preparation by suspending a test tube of hot water for a few minutes over the centre of the slide not quite in contact with the coverglass. For a time after being mounted the larvæ are in active movement, but before long even at tropical temperatures the majority come to rest and usually lie on their sides, the position most favourable for examination. A dry lens of one-sixth inch focal length is ample for diagnosis; an oil immersion usually disturbs the larvæ. If the larvæ will not

come to rest, they may be killed in an extended position by passing the preparation through the flame five or six times. They must then, however, be examined immediately and even then the features are somewhat altered. If the larvæ are to be examined killed, it is best to fix and clear them by Looss's method or a modification of it. This method and that of examining the larvæ alive have each their advantages. The writer has found the following modification of Looss's method convenient. By the use of phenol instead of glycerin or lactophenol there seems less liability to shrinkage and distortion, even if the evaporation is carried out rather rapidly. The larvæ are killed by pouring onto them at a temperature of 80° C. the following solution: phenol 7 parts, glacial acetic acid 3 parts, 75% alcohol 90 parts. They are left covered in this solution overnight after which evaporation is allowed to take place, until the volume has been reduced to about one-fifth of the original. The fluid is then transferred to a centrifuge tube and the larvæ thrown down and pipetted onto a slide. A coverslip is applied and sealed by means of paraffin wax and a hot wire. Such preparations are very satisfactory. Little shrinkage or distortion occurs and the larvæ are straight and extended. Usually, however, they are not lying on their sides, the effect of the ridges formed by the lateral lines.

Most of the larvæ observed were obtained by faecal culture from six individuals, from two of whom only necator larvæ were obtained, from two only ancylostome larvæ, while the other two had mixed infections. A large number of larvæ were carefully examined. Those of which some measurement or drawing was made numbered about 350. The writer's experience of helminthological literature convinces him that it is not superfluous to remark that all the measurements were very carefully made and every source of error guarded against.

No general account of the morphology of hook-worm larvæ can be given here. That of Looss may be consulted.⁽²⁾ All measurements given are thousandths of a millimetre. The words anterior, front and forwards are used in the sense of cephalad and posterior, behind and backwards in the sense of caudad. The genus of all the larvæ used for the measurements and observations herein was determined beyond doubt by examination of the buccal cavity.

The ages of the larvæ given below refer to the intervals between culture of the specimens and examination or killing of the larvæ. No attempts were made to obtain "starved" larvæ in the sense used by Looss, that is larvæ whose food had been reduced to a minimum during the growing period. Many larvæ were examined whose reserve granules had been depleted by age and by some writers these are included in the term starved.

The Buccal Cavity.

The differences in this structure between mature larvæ of *Necator americanus* and those of *Ancylostoma caninum* have been pointed out by Van Thiel.⁽³⁾ Unfortunately only the abstract of the paper in the *Tropical Diseases Bulletin* of December,

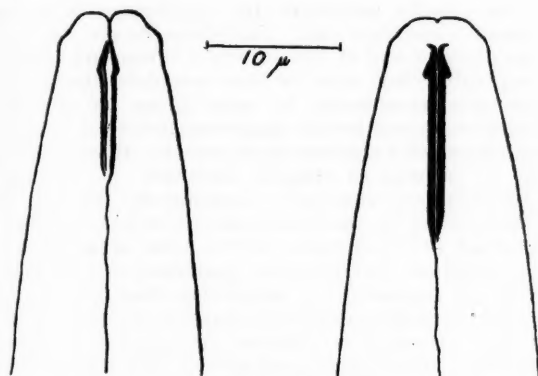


FIGURE I.

Anterior extremities of mature larvæ of *Necator americanus* (right) and of *Ancylostoma duodenale* (left) showing the buccal structure and the outline of the head as seen in optical section in the mesial plane. Both larvæ are seen from the left side. The sheaths are omitted.

1924, has been available. This structure in *Ancylostoma duodenale* has been found by the writer indistinguishable from that in *Ancylostoma caninum*.

The straight elongated buccal cavity, present in mature larvæ of both genera, has a more heavily chitinized and prominent appearance in *Necator americanus* than it has in *Ancylostoma*. In *Necator* its anterior part, when viewed from a lateral aspect, is shaped like a Scotch thistle head as shown in Figure I. The walls at their anterior extremities diverge and give the appearance in optical section of a pair of out-turning points. The two halves of the buccal structure (dorsal and ventral) are quite symmetrical anteriorly. No connexion is visible between the oral depression at the anterior end of the larva and the anterior end of the buccal structure. When the larva is viewed from a dorsal or ventral aspect, the appearance is slightly less distinctive and the out-turning points of the thistle head are not apparent. From these aspects, moreover, a fine line is usually visible, joining the oral depression to the front of the buccal structure. On the other hand in *Ancylostoma duodenale* the walls of the buccal cavity appear thinner and less conspicuous and its lumen somewhat larger. Anteriorly these walls converge and meet in a fine line which runs to the oral depression. This appearance, with slight differences, is seen from whatever aspect, dorsal, ventral or lateral, the larva is viewed. The fine line represents of course the closed portion of the mouth.

Another difference is that the chitinous buccal structure in *Necator* from the anterior end of the thistle to the point where the buccal cavity passes into the œsophagus is longer than it is in *Ancylostoma*. These lengths are about 15 to 16 microns and 10 to 10.5 microns respectively; the exact point where the buccal cavity passes into the œsophagus, is however often not easy to define.

The figure illustrating these differences (Figure II.) is intended to represent the appearances seen on examination with a high power when the axial

line of the head is in focus and the view is from the side; It is not intended as necessarily a correct interpretation of the real structure. In the figure of *Ancylostoma duodenale* the buccal cavity is represented as bounded by one line dorsally and two less prominent lines ventrally; these appearances possibly represent chitinous thickenings of a dorsal and of two ventro-lateral longitudinal ridges lying between the three angles (two dorso-lateral and one ventral) of a triradiate structure. Both drawings were made from larvæ viewed from the left side.

Although minute details have been gone into in this description of the buccal structures, it must be emphasized that their general appearance from whatever aspect they are seen, is different enough to enable the two genera to be distinguished rapidly and certainly with practice. This can be done in either living or suitably cleared specimens with objectives of one-sixth or one-third of an inch focal

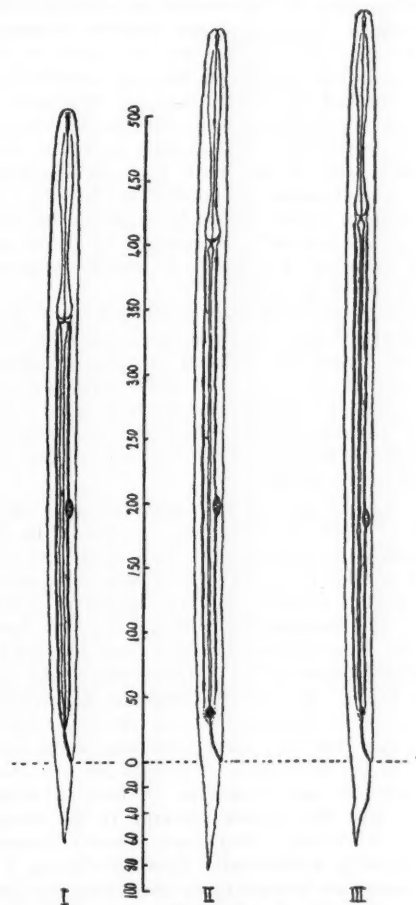


FIGURE II.

Outlines to scale of average mature larvæ of *Necator americanus* (I.), *Ancylostoma duodenale* (II.) and *Ancylostoma braziliense* (III.). To show the differences in the tail and the position of the genital rudiment. The differences in the posterior end of the intestine, the buccal structure and the œsophago-intestinal junction are also indicated. The scale is in thousandths of a millimetre. The sheaths are omitted.

length or even with a two-thirds with the diaphragm well closed; the diagnosis in the latter case is made by the more prominent refractile appearance and greater length of the buccal structure in *Necator*.

In the writer's opinion this feature, the buccal structure, is the most reliable single character. It is sufficient by itself for certain diagnosis and is seen readily enough to make fairly rapid work possible.

The Shape of the Head.

In mature *necator* larvæ the shape of the head approaches more nearly to an evenly rounded contour than it does in those of *Ancylostoma* in which it tends to have the shape shown in Figure I. The cephalic papillæ (not shown in the figure) are less prominent in *Necator* than in *Ancylostoma*. So is the oral depression.

The Œsophago-Intestinal Junction.

A difference in the Œsophago-intestinal junction consisting in an apparent gap between the Œsophagus and the intestine in the mature larva of *Necator americanus* but absent in that of *Ancylostoma* has been described by Cort⁽⁴⁾ and by Svensson.⁽⁵⁾ As a means of distinguishing the larvæ this feature has the advantage that a low powered objective, such as a two-thirds of an inch, is all that is required and of being situated near the point of least movement of active larvæ in water. On the other hand in the writer's experience it is not a sufficiently constant character to make diagnosis certain, if relied on solely.

In mature larvæ of both *Necator* and *Ancylostoma* the lumen of the intestine, as it passes forwards, becomes somewhat dilated at its anterior end, especially in *Necator* and then narrows abruptly just behind the Œsophageal bulb to form the short, narrow passage leading into the Œsophagus. The gut wall in the region of this narrowing forms a sphincter-like collar.

The appearance of a transverse gap or band, bright or dark according to the focus, in *Necator* separating the Œsophageal bulb from the intestine is due to the fact that the tissue composing this collar differs considerably in refractive index from that of the Œsophageal bulb on the one hand and from the more or less homogeneous material filling the dilated lumen of the anterior end of the intestine on the other. In *Ancylostoma* the difference in refractive index between these structures appears to be less and, further, the narrowing of the intestinal lumen at its anterior end is less abrupt; its walls turn inwards and forwards to form a short cone leading into the narrow passage to the Œsophagus, whereas in *Necator* they turn directly inwards and then slightly backwards, thus producing a transverse posterior boundary to the apparent gap. If the appearance of a complete gap is to be seen the narrow central passage in the collar region joining the intestine and Œsophagus must not be exclusively in focus; the appearance is therefore seen with closed diaphragm and a low power or with a higher power if the central passage is slightly out of focus.

As already mentioned the appearance is by no means a constant one. Variations in the shape of the anterior end of the intestinal lumen are mainly responsible for more or less complete absence of the gap appearance in some larvæ of *Necator americanus* and for an approximation to it in some specimens of *Ancylostoma duodenale*. When present to a pronounced degree, however, it excludes *Ancylostoma*. Svensson recommends the use of larvæ in which the reserve granules have been exhausted. Even in these, however, the appearance is not constant; but when the granules are very abundant the appearance is completely obscured. Apart from the depletion of the granules the age of the larvæ, after they have become mature, does not seem to affect this feature very much. The difference is much less readily seen in cleared larvæ than in living ones.

The Transverse Cuticular Striæ.

Van Thiel⁽³⁾ has pointed out that the cuticular striæ in mature larvæ of *Ancylostoma caninum* are less prominent than those of *Necator americanus*. This is true of *Ancylostoma duodenale* also, but is not a feature of much practical utility, because it is only a slight quantitative difference and difficult to judge rapidly with sufficient accuracy. The distance between the striæ probably differs slightly in the two genera, but is not a measurement which can be rapidly made. The striæ in both the genera are more prominent in the posterior part of the body than in the anterior.

The Posterior End of the Intestine.

A difference of minor importance and not constant between the mature larvæ of *Necator americanus* and *Ancylostoma duodenale* is to be found at the posterior end of the intestine. At this point in *Ancylostoma duodenale* is to be seen a small body of higher refractility than the neighbouring structures and easily distinguishable by its appearance from the cellular structures constituting the rudiments of various organs of the adult worm which are described by Looss⁽²⁾ in this region and the region immediately posterior to it. This body is merely an ampulliform dilatation of the posterior extremity of the intestine, leading into the rectum posteriorly and generally marked off from the intestinal lumen anterior to it by a constriction and by the fact that its contents are of higher refractive index. It is mentioned by Looss,⁽²⁾ page 364. It varies much in shape, size and appearance. The smallest examples tend to be round and about three microns in diameter, the larger ones fusiform. Looss states that it tends to disappear in old larvæ. It seems to be present in at least 90% of larvæ less than three weeks or a month old.

In *Necator americanus* on the other hand there is no such ampulla at the end of the intestine and there is seldom any aggregation of more refractile material at this point. This detail of structure is by itself of limited value as a differential character owing to its variability and the fact that an oil immersion lens is sometimes necessary to make certain whether it is present or not, especially if

reserve granules are abundant. It is not well seen in cleared larvæ.

The Position of the Genital Rudiment.

Korke⁽⁶⁾ has pointed out that in mature larvæ of *Necator americanus* the genital rudiment is in front of the point midway between the end of the œsophagus and the anus, whereas in mature larvæ of *Ancylostoma caninum* it is usually behind this point; he surmises that the same is true of *Ancylostoma duodenale*. This has been found to be a very useful distinguishing character. It has the advantage that no previous experience whatever is required for its use. The measurements needed are simple and may usually be rapidly made with sufficient accuracy with a low power. It is best to use larvæ fixed and cleared by Looss's method or the modification of it already mentioned, as the genital rudiment is then much more prominent than in living larvæ and moreover the larvæ are straight. Although, as will be mentioned below, these methods of preparation do affect the absolute measurements, no difference large enough to be material was found between living and prepared larvæ in the relative position of the genital rudiment. The two measurements required are from the posterior limit of the œsophageal bulb to the middle of the genital rudiment and from the latter point to the anus. The anus is a better point to select than the tip of the tail which is not always easy to define when the sheath is present. The anus may also be hard to see in some specimens; to minimize this difficulty the clearing by evaporation should not be carried too far. The rectal canal and the position of the anus are more evident in *Necator americanus* than in *Ancylostoma duodenale* both in living and cleared specimens.

No change in the relative position of the genital rudiment with age was detected in mature larvæ of either species, although looked for by measuring several batches of larvæ shortly after they had become mature and the same batches at later periods. The differences found were very slight and not significant for the numbers measured. Korke's⁽⁶⁾ statement that age, even after the larvæ have reached maturity, has some influence on the position of the genital rudiment was not confirmed.

In all 152 mature larvæ of *Necator americanus* of various ages from seven to one hundred and twenty-seven days and from various sources were measured

for the position of the genital rudiment and 141 specimens of *Ancylostoma duodenale* from various sources ranging in age from seven to forty-nine days. In each larva the distance from the end of the œsophageal bulb to the middle of the genital rudiment was expressed as a percentage of the distance from the œsophageal bulb to the anus. The average of these percentages in the 152 *Necator americanus* larvæ was 42.8, the extremes being 47.7 and 38.2. In the 141 *Ancylostoma duodenale* larvæ the average was 51.3 and the extremes 55.6 and 47.2. In only three of the 152 necators was the percentage above 47 and in only three of the 141 ancylostomes was it below 48. This measurement by itself will therefore determine the species correctly in the great majority but not in all cases.

Other Measurements.

Apart from the figures already given for the position of the genital rudiment relative to other points the absolute measurements made are of interest.

The modified Looss's method of fixation and clearing of larvæ already described causes a slight shrinkage in larvæ of both species. The total length as well as the measurements from the head to the end of the œsophagus, from this point to the genital rudiment, from this to the anus and from the anus to the tip of the tail are all diminished. The amount of this shrinkage was probably not determined with much accuracy; slight details of the technique of preparation probably affect it; it appears, however, that in each region for larvæ of both species it is usually less than 5% except for the œsophageal region where it is perhaps slightly more, about 7%.

Looss⁽²⁾ (page 360) infers that slight differences in size of mature larvæ must occur with age. These were not detected by the measurements carried out, possibly because they are too slight or because the number measured very shortly after maturity was insufficient.

Tables I. and II. give the average and extreme measurements of mature larvæ of *Necator americanus* and *Ancylostoma duodenale* in thousandths of a millimetre. They were from various sources and of various ages. The measurements of the fixed and cleared larvæ are given separately from these of the living.

TABLE I.—SHOWING MEASUREMENTS OF LIVING MATURE LARVÆ.

Species.	Number of Larvæ Measured.	Part Measured.	Average.	Maximum.	Minimum.
<i>Necator americanus</i> ..	46	Head to end of œsophagus ..	163.7	176	155
<i>Ancylostoma duodenale</i> ..	21	Head to end of œsophagus ..	165.9	182	155
<i>Necator americanus</i> ..	52	End of œsophagus to middle of genital rudiment ..	145.8	173	126
<i>Ancylostoma duodenale</i> ..	30	End of œsophagus to middle of genital rudiment ..	202.1	227	169
<i>Necator americanus</i> ..	52	Genital rudiment to anus ..	195.4	223	171
<i>Ancylostoma duodenale</i> ..	30	Genital rudiment to anus ..	195	223	155
<i>Necator americanus</i> ..	46	Head to anus ..	504.6	558	461
<i>Ancylostoma duodenale</i> ..	21	Head to anus ..	568	618	518
<i>Necator americanus</i> ..	41	Anus to tip of tail ..	63	72	57.6
<i>Ancylostoma duodenale</i> ..	13	Anus to tip of tail ..	84.7	93.6	76.7

TABLE II.—SHOWING MEASUREMENTS OF FIXED AND CLEARED MATURE LARVÆ.

Species.	Number of Larvæ Measured.	Part Measured.	Average.	Maximum.	Minimum.
<i>Necator americanus</i> ..	89	Head to end of œsophagus ..	152.8	176	126
<i>Ancylostoma duodenale</i>	107	Head to end of œsophagus ..	154	176	132
<i>Necator americanus</i> ..	100	End of œsophagus to middle of genital rudiment ..	142.1	176	112
<i>Ancylostoma duodenale</i>	111	End of œsophagus to middle of genital rudiment ..	199.5	238	173
<i>Necator americanus</i> ..	100	Genital rudiment to anus ..	188.4	209	155
<i>Ancylostoma duodenale</i>	111	Genital rudiment to anus ..	188.4	205	166
<i>Necator americanus</i> ..	89	Head to anus ..	483.6	540	412
<i>Ancylostoma duodenale</i>	107	Head to anus ..	542.5	600	502
<i>Necator americanus</i> ..	79	Anus to tip of tail ..	60.7	68.4	50.4
<i>Ancylostoma duodenale</i>	62	Anus to tip of tail ..	79.6	88	71.3

These figures show the considerable difference in average length between the two larvæ, *Necator americanus* being the smaller. But they also show that the total length or the length from head to anus is of limited use as a differential character on account of the considerable amount of overlapping.

On the other hand the length of the tail shows no overlapping if the living and fixed larvæ are taken separately; the maximum for *Necator americanus* is less than the minimum for *Ancylostoma duodenale* and the averages differ by about twenty microns. The stumper and more rapidly tapering tail in *Necator americanus* can often be distinguished at a glance from that *Ancylostoma duodenale*.

The measurement which shows the most pronounced difference, however, is that from the end of the œsophagus to the middle of the genital rudiment, whereas the distance from the genital rudiment to the anus is about the same in each species. This is of course the same feature that was pointed out in the discussion on the relative position of the genital rudiment. Probably, however, a single measurement from the œsophagus to the genital rudiment is not such a reliable means of discrimination as the two measurements required to determine the relative position of the genital rudiment in the body. For it must be emphasized that very small, starved specimens of ancylostome larvæ are not included in these figures. But as stunted larvæ are rare in properly made artificial faecal cultures, it is thought that when larvæ from such cultures only are being dealt with, this one measurement, from the œsophagus to the genital rudiment, will prove at once by far the simplest and a sufficiently reliable means of discrimination in practical routine work.

It will be seen that the average of this measurement for *Necator americanus* is about fifty-six microns less than for *Ancylostoma duodenale* and that the longest measurement in a necator larva exceeds only slightly the minimum for a larva of *Ancylostoma duodenale*. Even if living and cleared larvæ were taken together, it was found that in all but three out of 152 necators this measurement fell below 173 microns and in all but two out of 141 larvæ of *Ancylostoma duodenale* above this figure.

Looss's table of measurements of mature larvæ of *Ancylostoma duodenale*⁽²⁾ are given below for comparison. It is evident in the first place that his starved larvæ were much smaller specimens than have been found in the present series. Their average total length is much less than that of the smallest here recorded. But considering only his figures for normal larvæ, of which the total length from head to tip of tail approximates the average measurement of the present series, it is apparent that there are some remarkable discrepancies in the relative lengths of the different parts. The measurement from head to end of œsophagus is shorter and that of the tail longer than has been found by the writer.

Looss does not state the number of larvæ measured or whether they were living or prepared. In his figure of a normal mature larva (Plate XVI, Figure 201) the tail measures about eighty-four microns, agreeing with the average found by the writer.

The Larvæ of *Ancylostoma Braziliense* and *Ancylostoma Caninum*.

In hookworm endemology some of the animal hookworms have to be considered. In examining

TABLE IV.—SHOWING MEASUREMENTS OF LIVING MATURE LARVÆ OF *ANCYLOSTOMA BRAZILIENSE* AND *ANCYLOSTOMA CANINUM*.

Species.	Number of Larvæ Measured.	Part Measured.	Average.	Maximum.	Minimum.
<i>Ancylostoma caninum</i> ..	2	Head to end of œsophagus ..	153.5	162	145
<i>Ancylostoma braziliense</i>	11	Head to end of œsophagus ..	161.9	171	151
<i>Ancylostoma caninum</i> ..	5	End of œsophagus to middle of genital rudiment ..	227.4	252	197
<i>Ancylostoma braziliense</i>	14	End of œsophagus to middle of genital rudiment ..	236.1	274	220
<i>Ancylostoma caninum</i> ..	5	Genital rudiment to anus ..	185	194	168
<i>Ancylostoma braziliense</i>	14	Genital rudiment to anus ..	188.6	205	173
<i>Ancylostoma caninum</i> ..	2	Head to anus ..	534	558	510
<i>Ancylostoma braziliense</i>	11	Head to anus ..	583.6	613	544
<i>Ancylostoma caninum</i> ..	4	Anus to tip of tail ..	74.5	77.5	72
<i>Ancylostoma braziliense</i>	6	Anus to tip of tail ..	64.5	67.6	60
<i>Ancylostoma caninum</i> ..	5	Position of genital rudiment ..	55.1	57.5	51.8
<i>Ancylostoma braziliense</i>	14	Position of genital rudiment ..	55.6	58.4	54.1

suspected soil for larvæ of human hookworms those of the common worms of the dog and cat, *Ancylostoma braziliense* and *Ancylostoma caninum*, may be a source of error. Moreover *Ancylostoma braziliense* is a not infrequent parasite of man, though the infection is always light.

Ancylostoma braziliense has not yet been recorded from man in Australia, but this is doubtless because it has not been looked for sufficiently.

The possibility must be admitted of the presence of *Ancylostoma braziliense* in one or more of the persons used in this investigation and that some of the larvæ examined were of this species. However, the aborigines with mixed necator and ancylostome infections who provided much of the material, were afterwards each treated with a single dose consisting of two cubic centimetres of carbon tetrachloride and one cubic centimetre of oil of chenopodium. All the worms passed were certainly not recovered, but sixteen necators and three ancylostomes were got from one individual and from the other six necators and sixteen ancylostomes. All the ancylostomes were *Ancylostoma duodenale*.

The writer is not aware whether the larvæ of *Necator americanus* are closely resembled by those of any animal hookworms, apart from *Necator suillus*, found in pigs in Trinidad, of which even the adults are doubtfully separable from *Necator americanus* by morphological characters.

The larvæ of *Ancylostoma braziliense* and *Ancylostoma caninum* have hitherto been regarded as indistinguishable from each other and from larvæ of *Ancylostoma duodenale* by morphological characters. The complete paper of Stekhoven and Stekhoven-Meyer⁽¹⁾ who compared these larvæ without however finding any pronounced differences, has unfortunately not been available.

A few mature larvæ of each of these species have been examined. They were got by teasing up females obtained from a cat and a dog *post mortem* and culturing with earth and boiled faeces. In the buccal structure and the other features which have been described, the larvæ of both species closely resembled those of *Ancylostoma duodenale* and were easily distinguishable from those of *Necator americanus*. Between the mature larvæ of these three species of the genus *Ancylostoma*, but especially between *braziliense* and *duodenale*, some very slight differences were noticed, insufficient, at any rate without further work and the examination of a large number of specimens, to make reliable specific diagnosis possible.

A difference of some probable utility between *duodenale* and *braziliense* is to be found in the tail; in *braziliense* there is often a slight but fairly abrupt dorsal bend in the tail at about the point where the pair of caudal papillæ is situated; further the length of the tail from anus to tip is less than in *Ancylostoma duodenale* and near to that of *Necator*. The tail length in mature hookworm larvæ is a fairly constant character. It does not change perceptibly with age or on loss of the sheath.

The dilatation of the posterior extremity of the intestinal lumen in *Ancylostoma caninum* resembles

that in *Ancylostoma duodenale*, but in *Ancylostoma braziliense* it is usually smaller and the collection of material within it is very refractile and of irregular shape presenting the appearance of an angular or elongated granule.

The cephalic papillæ in *Ancylostoma caninum* are usually slightly more prominent than in either *duodenale* or *braziliense*; a minute difference only.

In both these animal ancylostomes the genital rudiment is still more posterior in position than in mature larvæ of *Ancylostoma duodenale*. The few measurements made of these larvæ are given below and may be compared with those of *Ancylostoma duodenale*. They were all measured alive. The figures given against "position of the genital rudiment" are the percentages already referred to, namely the length from the end of the œsophagus to the middle of the genital rudiment expressed as a percentage of the length from the first point to the anus.

TABLE III.—SHOWING LOOSS'S FIGURES FOR MATURE LARVÆ OF *ANCYLOSTOMA DUODENALE*.

Part of Larva Measured.	Normal Larvæ.	Starved Larvæ.
Tip of head—end of œsophagus	139	139
End of œsophagus—middle of genital primordium	212	127
Middle of genital primordium—anus	166	120
Anus—tip of tail	100	70
Total length	617	459

The excretory vesicle was among the structures examined in these larvæ, both in necators and in the three species of ancylostomes. In living mature larvæ of all these species a fairly regular rhythmic filling and emptying of the vesicle is observable, like the beat of a heart. The vesicle slowly fills from behind and then much more suddenly contracts and empties often incompletely through the excretory pore. The character of the action appears to constitute another slight difference between the genera *Necator* and *Ancylostoma*.

Practical Applications.

These methods of determining the species of human hookworms from the larvæ have been thoroughly tried in routine work. Fæcal specimens sent in from various parts of Queensland to be examined for ova have been cultured and the larvæ identified as necators or ancylostomes. In this way interesting light is being thrown on the patchy distribution of the two species in North Queensland, the result probably of their fairly recent introduction in a thinly populated country from two main sources, necators by the Pacific islanders who formerly worked the sugar farms, and ancylostomes by Southern Europeans. The species, if any, originally harboured by the aborigines is unknown. Soil specimens from various districts have also been examined and both necators and ancylostomes found in some of them; in this case, however, it is

impossible at present to say with certainty whether the latter belong to the species *duodenale*.

An interesting practical application of the method has been the discovery by experiment that the system of pan conservancy as carried out in many parts of Queensland often prevents completely the development of necator larvæ but not of ancylostomes.

Summary.

The differences between the mature larvæ of *Necator americanus* and *Ancylostoma duodenale* have been described in detail. They afford a practical method superior to that of worm counts for determining the species distribution. By this means also necators can be distinguished from ancylostomes in samples of infected soils.

The method may be used to determine the species present in an individual before treating him. This is a matter of importance since carbon tetrachloride is extremely effective against *Necator americanus*, more so than oil of chenopodium. But against *Ancylostoma duodenale*, a much more difficult worm to eradicate, oil of chenopodium has the higher efficiency and should always be used either alone or in combination with carbon tetrachloride, in spite of its unpleasantness.

A procedure recommended for routine work is as follows. The small faecal specimen obtained is divided into two parts and if ova are found in one, the other is cultured and mature larvæ obtained. These are isolated in clean water, fixed and cleared and finally mounted by the methods described. A single measurement under a two-thirds of an inch objective of the distance from the œsophagus to the middle of the genital rudiment will then separate the genera correctly in well over 95% of cases, provided the larvæ have been suitably cultured and are well nourished. If absolute accuracy in diagnosis is desired, it may be obtained by examination of the buccal cavity; this procedure is nearly as simple as the other, but requires a little practice. Time and labour are saved by examining the larvæ alive if a few only are to be looked at from a culture, but not otherwise.

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Reports of Cases.

HEALED DISSECTING ANEURYSM GIVING RISE TO THE APPEARANCE OF A DOUBLE AORTA.¹

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DISSECTING aneurysms are rare. It would seem that only about three hundred cases have been reported. In the case to be described the condition was unsuspected during life and even at the *post mortem* examination itself. The heart and aorta (in the latter an ordinary aneurysm was thought to be present) were preserved for my inspection later and it was only when making this detailed examination that the true nature of the enlargement was detected. The aorta had been cut through at the level of the diaphragm and an inspection there would have shown the apparent doubling of the tube. This case is further remarkable inasmuch as the condition had been present for some years and the blood had found its way back again into the arterial system by reperforation. Resnik and Keefer state that in only five of the recorded cases had recovery taken place by a reentrance of the blood. There is no obvious sign of degeneration of any appreciable extent in the wall of the aorta in this case. No history has been obtained of the symptoms that doubtless were manifested when the blood first burst partly through the wall of the aorta. Apparently once having made its way partly through the coat and having found a plane along which it could spread, the blood must have continued separating the outer part of the vessel wall from the inner and has been able to do so with relative ease in front right up to the aortic cusps, where the sac ends blindly in front of the aorta and below to the diaphragm at least and possibly to the bifurcation, the aneurysmal sac appearing again in front of the original aorta. The separation of the wall into two layers has not taken place over the posterior third or a little more of the aorta. Why the stripping should cease here is difficult to understand. With a little force the tear can be extended in the museum specimen to this posterior portion of the original wall. Perhaps the support of the vertebral column may have had something to do with this. The original tube of the aorta thus appears as a kind of fold or "tuck" along the posterior wall when the descending thoracic portion of the aneurysmal dilatation is opened and inspected. The "lacings" which are mentioned in our description of this specimen as connecting the outer wall of the sac with the inner tube, evidently represent more resistant trabeculae which tend to bind the layers of the aorta to each other. Fenestræ, representing the original orifices of, for instance, the costal arteries, appear in the wall of the inner tube, the blood thus passing to the aneurysmal sac and from the outer wall of this these vessels now emerge. The inner surface of the sac is shining and polished. The condition is obviously one of long standing. Equilibrium has been attained and the lesion is no longer progressive. It may be spoken of as "healed."

There is no evidence of syphilitic aortitis. The walls of the original channel and of the aneurysmal space are also only slightly effected with atheromatous changes and there appears to be no calcification. It therefore is difficult to understand how partial rupture of the wall of the aorta had occurred, considering these healthy appearances. Was it traumatic in a healthy or relatively healthy vessel and if so what kind of trauma could exert this effect? Or did the rupture take place in an area of slight atheroma and high blood pressure force blood through the rent? The

¹ Read at a meeting of the South Australian Branch of the British Medical Association on October 23, 1926.

relatively healthy appearances presented by the specimen suggest a congenital abnormality resulting in a form of doubling of the aorta, but there seems to be no support to such a view from the developmental aspect.

The details of the case are as follows.

Clinical History.

C.F., aged fifty-four years, was admitted to the Adelaide Hospital under Dr. F. S. Hone on August 14, 1925. He had been bedridden for five years since he was in hospital previously. He was believed to have an aortic aneurysm. The apex beat of the heart was in the seventh space in the anterior axillary line. A large, heaving impulse could be felt all over the chest and a systolic thrill was present over a large part of the right side of the chest. On auscultation a loud systolic murmur could be heard everywhere. The heart dulness was increased. A bed sore developed. An X ray photograph showed an extremely dilated heart with great enlargement of the ascending aorta. On August 25 the patient became moribund and died.

Post Mortem Notes.

On *post mortem* examination there was straw coloured fluid in both pleural cavities and some pleuritic adhesions were present over the right lung. There were some universal soft pericardial adhesions. The aortic cusps were normal and the blood passed into a normal aorta. In front of the commencement of the ascending aorta, however, there was a larger sac with a lining like that of the true aorta. This ended blindly at the level of the aortic cusps, it ascended in front of the ascending aorta, passed above the arch and behind the descending aorta. This had been cut off at the diaphragm so that how far the doubling extended downwards is not known.



FIGURE I.

The dissecting aneurysm has been laid open and shows the original aorta exposed as a fold or tuck in the walls of the aneurysm. The lacings can be seen passing from this inner tube to the adjacent wall of the aneurysm.

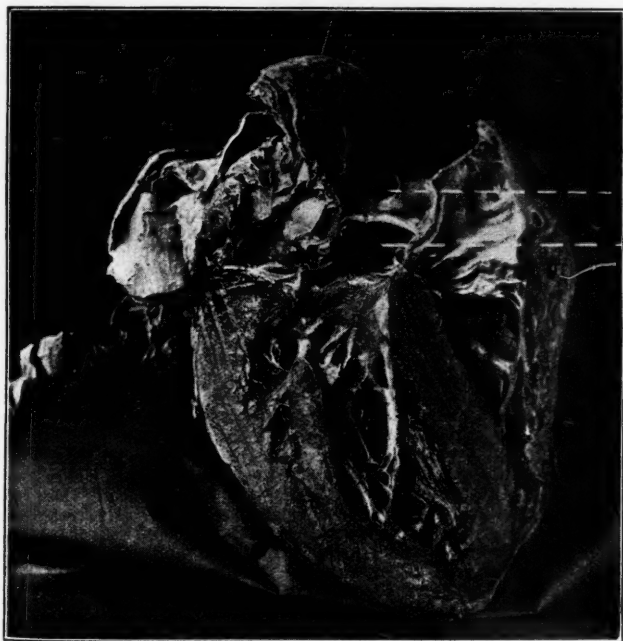


FIGURE II.

The heart has been bisected. At B is seen an orifice with everted edges through which the blood escaped from the aorta C into the aneurysmal sac. The aorta has been cut through just above the aortic valve. The dissecting aneurysm ended blindly in front just above this valve.

The lumen of this sac was considerably greater than that of the aorta, constituting an aneurysmal dilatation. The true aorta appears as a raised fold on the wall of the larger cavity. The aorta opens into the sac a short distance above the blind commencement of the sac by an irregular orifice with rolled back edges which would admit a finger. The great vessels at the root of the neck open into the true aorta, but opposite to where they do so is a defect in the wall opening into the sac. In places delicate strands, threads or lacings appear as loops in the wall of the sac stretching from the raised fold, representing the true aorta, to the sides. The appearance of the aorta suggests neither an atheromatous change nor syphilitic aortitis. There is much hypertrophy of the left ventricle and dilatation of the right auricle. The liver was somewhat nutmeggy and the spleen showed chronic venous congestion.

References to Dissecting Aneurysms in the Literature.

W. G. MacCallum⁽¹⁾ in an article on dissecting aneurysms refers to the literature on the subject and describes five cases. One of these, represented by Figure II, in his article and also reproduced in his "Textbook of Pathology," is remarkably like the case now recorded, even to the peculiar "lacings" connecting the inner wall of the original aorta with the sides of the false passage. In several of the cases recorded by MacCallum the aorta has been split through the centre of the media for an extensive distance, sometimes to the bifurcation. MacCallum states that cleavage somewhere in the middle of the musculature can take place much more easily in a sclerotic aorta than in a normal aorta. Each of the patients seems to have

had a high grade of arteriosclerosis. In two of his cases the dissecting aneurysm had been present for some time.

In the case particularly resembling our own the patient was a male negro, aged thirty years. His condition had been diagnosed as aneurysm for a year previously. At the autopsy a large retort-shaped sac covered the ascending aorta and arch. When cut open in the bottom of this lay a tube composed really of the inner walls of the aorta, the lumen of which was the real lumen of the aorta. This began at the summit of the arch of the aorta, that is at the neck of the aneurysm, by a large orifice, the ragged edge of which projected into the lumen of the artificial canal. Across the space between the actual aorta and the canal formed by the dividing wall, there ran cord-like trabeculae and adhesions in considerable numbers. This outer canal lay in front and to the left of the aorta and did not completely encircle it. Cleavage of the aortic wall had thus taken place in front and to the left affecting only about half its circumference. The channel was lined by endothelium and was fairly smooth. The splitting extended down in the left common iliac vessel. The intercostal vessels were in many instances torn through at their origin and although there was a hole left in the inner wall, the artery really opened from the outer tube. Similarly the right renal artery opened from the outer tube.

W. H. Resnik and C. S. Keefer, in an article entitled "Dissecting Aneurysm with Signs of Aortic Insufficiency,"⁽¹⁾ report a case of dissecting aneurysm in which there were signs during life of aortic insufficiency, but the valves were found normal at the necropsy. They state that about three hundred cases of dissecting aneurysm have been reported, the majority of the patients dying soon after development of the lesion. In only about five had recovery taken place by reperforation into the arterial system, usually into the aorta. Their patient was a coloured labourer, aged fifty-seven years. His health had been excellent, except for some slight dyspnoea on exertion, until about four weeks before admission to hospital, when he was seized with a sudden, dull, aching pain behind the sternum and about the umbilicus. Since then he had remained in bed and severe symptoms had followed, the patient being unconscious on admission to hospital. At the autopsy the internal lining of the aorta revealed nothing suggestive of syphilis. There was a sharp transverse break in the intima three centimetres in length, just above the aortic valves and a second sharp transverse cut 1.5 centimetres in length a few centimetres below this extending to the media which was slit down to the bifurcation of the aorta. The dissecting aneurysm was lined with endothelium.

References.

- ⁽¹⁾ W. G. MacCallum: *Bulletin of the Johns Hopkins Hospital*, Volume XX, January, 1909, page 9.
- ⁽²⁾ W. H. Resnik and C. S. Keefer: *Journal of the American Medical Association*, August 8, 1925, page 422.

GUMMA OF THE INTERVENTRICULAR SEPTUM OF THE HEART GIVING RISE TO HEART BLOCK.¹

By J. BURTON CLELAND, M.D. (Syd.),
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Hospital.

GUMMATA of the heart are rare. In the case to be described the gumma was of considerable size, being about 3.6 centimetres (one and a quarter inches) in diameter. It was situated in the upper part of the interventricular septum and formed a rounded mass which projected more particularly into the upper part of the right ventricle, interfering with the direct course of the blood through the ventricle to the pulmonary artery, giving rise in consequence to cardiac murmurs. It was only the day before death that interference with conduction was manifested by the pulse being reduced to thirty-five to the minute.

Clinical History.

W.T., a widower, *atatis* fifty-eight, a horsebreaker, was admitted to the Adelaide Hospital under the care of Dr. C. T. C. de Crespigny on May 5, 1925. He complained of shortness of breath. He had first noticed this after exertion two years before and had gradually become so bad that the slightest exertion caused a choking feeling in his throat and he had to hold on to something in order to breathe. He had not had any swellings in the legs or feet and felt strong in himself. He passed his urine four or five times a day and two or three times at night. His bowels were opened regularly. He had once been a heavy drinker, but had given it up for the last twenty-five years. He had never had rheumatic fever nor any venereal disease. Three of his children had died at the age of about one year. His wife had not had any miscarriages. His temperature was normal and his respirations were 20 in the minute. He was a stout, muscular man with a very red face and not at all distressed in his breathing. He had dilated veins over the left side of his chest and the upper part of the left side of his abdomen. There was no capillary pulsation visible on his forehead. He had definite pulsation of the episternal notch. His apex beat was visible and palpable in the fifth left interspace ten centimetres (four inches) from the midline. There was an unusually wide band of dullness over the *manubrium sterni* continuous with the cardiac dullness. A to-and-fro murmur was audible all over the pericardium and could be heard best over the third left interspace at the left sternal border. It could be traced up to the carotid arteries and out along the subclavicular arteries to the



FIGURE III.
The dissecting aneurysm laid open in the neighbourhood of the diaphragm. The aneurysm is the larger channel. At E can be seen the original lumen of the aorta. At D can be seen some of the lacings passing from the inner tube to the adjacent sides of the aneurysm. The openings of some of the costal arteries, from the true aortic lumen into the aneurysmal dilatation, can be seen higher up.

¹ Read at a meeting of the South Australian Branch of the British Medical Association on October 28, 1926.

centre of the clavicle. Whispering pectoriloquy could be heard down to the level of the sixth dorsal vertebra. No tracheal tug was present. His pulse rate was 80 to the minute and the pulse was of the water-hammer type. His blood pressure on the right arm was 162 millimetres systolic, 60 diastolic and on the left arm 155 systolic and 60 diastolic. Examination of the central nervous system, alimentary, respiratory and urinary systems revealed nothing abnormal. His blood gave a weak response to the Wassermann test. A radiogram was taken of his chest which showed general enlargement of his heart, especially on the right side and some dilatation of the ascending aorta. There was no aneurysm of the arch or of the descending aorta. There was some raising of the right side of the diaphragm. He was given 0.6 gramme (ten grains) of potassium iodide three times daily and intravenous injections of "Novarsenobillon" in gradually increasing doses at intervals of a week. The dose of potassium iodide was subsequently increased. He remained fairly well while resting in bed and on May 25 he was allowed to get up. He felt fairly well while up and about, but on June 1 he complained of pain in his left arm and his left elbow was found to be swollen, hot and tender. Movement of this joint was a little painful. The elbow was fomented and the inflammation gradually subsided. After any exertion the patient's colour became reddish-purple. On June 6 another radiogram was taken and showed no alteration. On June 16 he had a "fainting" turn and lost consciousness for a few seconds. He vomited three times that day. On the following day he still felt out of sorts and vomited a few times, but did not faint any more. This vomiting continued until his death on June 19. His pulse rate on June 18 was only 35 to the minute. He was given 0.3 mil (five minims) of adrenalin subcutaneously, but his pulse rate remained unaltered.

Post Mortem Notes.

At post mortem examination the apex of the heart was opposite the sixth rib in the anterior axillary line. The right ventricle occupied an undue amount of the front aspect of the heart. The heart was tilted so that its right border was nearly horizontal with a slight dip to the left. The right auricle was considerably dilated and its wall thickened. The tricuspid orifice easily admitted four large fingers. There was some slight opacity of the tricuspid valve and the ring was dilated. The right ventricle was not definitely hypertrophied, but was somewhat dilated. The pulmonary valve was normal. Below the pulmonary valve the interventricular septum bulged, forming a rounded obstruction to the direct passage of blood from the right ventricle to the pulmonary artery. The bulged area felt firm. The left auricle was considerably dilated and its wall thickened. The mitral orifice admitted three fingers; its valve was healthy. Below the anterior cusp of the aortic valve was a ragged pale vegetation twelve by six millimetres (half-inch by quarter-inch) in size, attached by a delicate point to the base of the cusp. Owing to the mass in the upper part of the septum there was a rather deep narrow sulcus in the ventricular wall beneath the cusp. The left ventricle was hypertrophied and dilated. In the upper part of the interventricular septum on its posterior aspect was a firm fibrotic mass 3.2 centimetres (one and a quarter inches) in diameter, showing a few indefinite degenerated areas. Its upper part reached the attachment of the pulmonary cusps and it extended down in the septum for half its length. There was diffuse fibrosis beyond it. The adventitia of the aorta was thickened and fibrous and adherent to the surrounding parts. The whole of the aortic wall was thickened. Its intima showed diffuse pale areas with a tendency to become fatty and a linear arrangement. The orifices of the coronary vessels were patent. The vessels were thickened but not specially atheromatous. The descending thoracic aorta was free from changes. There were no other lesions of moment except a large solitary gall stone and evidence of chronic venous congestion of the liver, spleen and kidney. Microscopical examination of the gumma revealed very dense fibrosis with necrosed areas and collections of round and plasma cells.

HYSTERICAL FUGUE.¹

By S. EVAN JONES, M.B. (Syd.),
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Sydney.

Clinical History.

THE patient, a man aged thirty-one years, is free from hereditary taint and gives a history of a healthy and normal life up to a few years ago. During the war he was on naval patrol service in the islands and suffered from recurrent attacks of malaria and sustained two blows to the head, neither of which caused unconsciousness. When he becomes depressed the patient complains of pain at the site of these injuries. After demobilization he lived an idle life, gambling and drinking, sometimes to excess, until he had expended his savings. He married in 1921 and has two children. Since marriage the patient has had only irregular occupation and his circumstances have been straitened. It is probable that partly for this reason his married life has not been happy. He gives a history of recurrent attacks of mental depression during the last five years. The attacks usually lasted a few weeks and cleared up after he went away for a holiday, apparently they were provoked by financial and domestic worry. In 1922 the patient was defrauded of a considerable sum of money on which he was counting to establish a home. He became depressed and one day found himself on the Melbourne express at Albury without any recollection of how he had got there, the last thing he remembered being his departure from home that morning. Following this fugue there was, as already stated, a succession of depressive attacks which seem to have become more frequent lately. During the last few months the patient has had difficulties in obtaining work.

He was admitted to Broughton Hall on November 3, 1926, with the history that on October 31, a Sunday, he was found walking down Pitt Street. When spoken to it appeared that he thought the day was Friday and that he had just left work, but, being convinced that it was Sunday, he realized that he had had a lapse of memory and was escorted home. On admission to hospital he was depressed and worried and complained of headache localized about the site of his old injuries. He was able to describe the events of Friday, October 29, up to the time he left work in the evening, but could give no account of succeeding events until he was found in Pitt Street on Sunday night. Thus there was amnesia for the period of two days.

Discussion.

When the fugue has lasted only a short time as in this case, there is little difficulty in restoring the memory for the period of the fugue, the procedure, a modified hypnosis, being as follows: It is explained to the patient that he is unable to recall voluntarily the forgotten incidents because in his ordinary waking state certain tendencies are active in opposing the entry of the memories into consciousness. He is told that the influence of these contrary tendencies will be avoided by his entering a state similar to sleep (hypnosis) and that then the forgotten incidents will be recalled. The patient cooperated well and hypnosis was induced in the usual manner. He was instructed not to make any voluntary effort to remember the suppressed incidents, but to concentrate all his attention on vividly reproducing in his mind the ideas suggested to him by the operator, the intention being to induce him to visualize or hallucinate his recollections and he was told that if he did this, he would see a continuing picture of his activities during the fugue. He was then instructed to visualize his departure from home on Friday morning and the succeeding events of that day were reviewed as vividly as possible.

¹ Read at a combined meeting of the New South Wales Branch of the British Medical Association and of the Section of Neurology and Psychiatry on November 25, 1926.

When he had arrived at the stage of leaving his work that night (the beginning of the amnesic period) there was a delay which was ultimately overcome and the patient proceeded to describe in detail with more or less hesitation the events of the fugue. It is unnecessary to describe these fully but it appeared that on leaving work he met a companion and proceeded to a week-end camp on the South Coast where Saturday and Sunday were spent fishing and drinking. An attempt was made to elicit his emotional state whilst in the fugue and he described a feeling of intense depression "as if a heavy cloud were hanging over me." Apparently also he had no clear recollection of how he came to be in the South Coast, that is, during the fugue he had a more or less complete amnesia for his previous life. The patient awakened spontaneously when he described his meeting the friend in Pitt Street and the incidents as recalled were synthesized with his conscious memories. The escape from a difficult situation by flight is a well known mechanism of psychopathology. The flight may be metaphorical in that the patient substitutes pleasurable phantasy for painful reality or may be an actual flight, the patient leaving for a time the environment that was responsible for his emotional conflict. When the actual flight is accompanied by amnesia it is termed a fugue and is one of the forms of reaction to painful situations that occur in hysteria. A fugue may last for any period from hours to days or months, in the latter case verging on what is known as dissociation of personality or multiple personality. Fugues have also close relations with hysterical retrograde amnesias.

In our patient a definite neuropathic tendency is indicated by the recurrent attacks of depression. In the present instance the fugue was provoked by the anxiety and worry over domestic trouble and financial difficulties.

The method used to recall the suppressed memories is a limited or controlled association of ideas which is aided by the induction of a state of consciousness in which voluntary efforts at recollection are suspended. This state is akin to, but not the same as hypnosis and is what Sidis terms the hypnoidal state, intermediate between hypnosis and waking consciousness. In this state there is a partial dissociation of personality, a condition of highly circumscribed though active attention, in which mental experiences are not *pari passu* synthesized with the personality. It is as if the patient were placed in a position of detachment and is enabled to regard his mental activities as an onlooker. It does not always happen that incidents recalled in this manner are immediately assimilated into the personality. Sometimes they temporarily impress the patient like a dream, that is, as something which represents part of his personal experiences, but not closely linked up with his conscious personality. Usually, however, the recalled memories are rapidly synthesized and assimilated and placed in proper temporal relation to the unexpressed personal experiences.

ACUTE POSTOPERATIVE DILATATION OF THE STOMACH.

By GILBERT BROWN, M.B., Ch.B. (Liverpool),
Adelaide.

ACUTE dilatation of the stomach may follow any operation. Polak⁽¹⁾ found it was recognized in 0.8% in a series of one thousand celiotomy operations.

In 1908 Laffer⁽²⁾ reported ninety-seven collected cases of which 69% occurred after laparotomy.

Among the many suggested causes are rough handling of the stomach and intestines, drainage by tube or gauze pressing on the pylorus, constriction of the third part of the duodenum between the mesentery and the vertebral column, especially when the patient is in the Fowler position, fermentation of retained food, aerophagy, toxæmia, reexcretion of ether into the stomach, excessive intake of fluids, especially soda water. Little proof is forthcoming

for any of these theories and the ætiology remains obscure.

The mortality is high, as Laffer states that in a series of 217 cases from all causes 63.5% of patients died.

Treatment must be prompt and active, or death follows in a few hours. The case to be related followed an operation on the throat and nose.

R.N.P., ætatis forty-four, a bull-necked, powerful man of about eighty-nine kilograms (fourteen stone) was operated on by Dr. H. M. Jay on February 6, 1925.

At 7.30 a.m. a hypodermic injection was given of morphine 0.016 gramme (a quarter of a grain) and atropine 0.6 milligramme (one-hundredth of a grain). At 8.30 a.m. anaesthesia was induced by the open method, nine cubic centimetres of ethyl chloride, one cubic centimetre of a mixture containing two parts of chloroform and three parts of ether and thirty cubic centimetres of ether being required. At 8.36 a.m. a change was made to the Israel Carmody ether and suction apparatus and the Davis gag was inserted. At 8.40 the operation was begun and the tonsils were enucleated by dissection and slow snare. All hæmorrhage having ceased, a postnasal gauze plug was introduced and the gag replaced by a double airway. Submucous resection of the nasal septum was performed and the operation concluded at 9.47 a.m.

Pulse rate and respiration before and after the operation were 80 and 20 and 108 and 26 respectively.

The patient was returned to bed and placed in the semi-prone position until he was conscious. Slight vomiting occurred on two or three occasions during the next three or four hours.

At 4 p.m. he complained of severe upper abdominal pain and great thirst. Drinks of water were given, but immediately rejected. A hypodermic injection of morphine 0.01 gramme (one-sixth of a grain) was given and some relief was obtained. Vomiting, however, recurred and the pulse and respiration rates increased.

Dr. Jay asked me to see the patient with him which I did at 8.30 p.m. The man was propped up in bed, pale and sweating. He complained of great abdominal pain and begged for relief. Respiration was 30 to the minute and pulse rate 132. The abdomen was distended and more prominent in the upper half. It was tympanitic and the liver dulness was absent. There was neither rigidity nor tenderness. Auscultation of the chest revealed no adventitious sounds. An endeavour was made to empty the stomach by large drinks of a warm solution of sodium bicarbonate. This was to save him the passage of a stomach tube so soon after a tonsillectomy. A litre drunk quickly and some blood-stained fluid and gas were returned, but little relief was obtained. The pulse rate increased to 156 and the volume became very poor, sweating was profuse and he seemed in *extremis*.

One cubic centimetre of pituitary extract was injected into the buttock and a stomach tube was passed, some gas was immediately expelled. Lavage was carried out with warm solution of sodium bicarbonate until the wash was free from blood stain.

Relief was immediate and twenty minutes later pain had disappeared, the abdomen was flat, pulse and respiration rates were 112 and 22 respectively.

Recovery from this time was uneventful.

The cause of the acute dilatation of the stomach in this patient is quite unknown. It is remarkable for the fact that there was no abdominal interference, the onset was less than six hours and the recovery almost immediate after washing out the stomach.

Acknowledgment.

I have to thank Dr. Jay for permission to publish this case.

References.

- (1) Polak: "Acute Gastric Dilatation as a Post-operative Complication." *New York Medical Journal*, 1909, Volume LXXXIX, page 1184.
- (2) Laffer: "Acute Dilatation of the Stomach and Arterio-mesenteric Ileus." *Annals of Surgery*, 1908, Volume XLVII, page 533.

ARSENICAL NEURITIS TREATED BY THE INTRAVENOUS INJECTION OF SODIUM THIOSULPHATE.

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THE following case is of interest as it demonstrates a chronic arsenical neuritis following a single large dose and the elimination of the drug by sodium thiosulphate accompanied by rapid clinical improvement.

Patient X consulted me with the history that seven months previously he ate some potatoes boiled in water obtained from a kerosene tin containing one pound of arsenic, a half-pound of washing soda to four gallons of water. The other members of the party vomited profusely half-way through the meal, but patient X did not feel ill till much later when, realizing that he was poisoned, he tried to make himself vomit. This he succeeded in doing once; later he became seized with violent abdominal cramps. He was then rushed to hospital and was admitted in a collapsed state. He suffered from intense purging for a few days and about the fifth day he developed a dermatitis involving the scrotum and the hands and feet. He was allowed out of bed on the twelfth day and on attempting to walk he complained that his feet felt as if they had springs beneath them; he also noticed that all objects felt like velvet. On the seventeenth day he returned home feeling very weak and powerless, being able only to shuffle along. He was ordered to rest in bed, advice he failed to take, but finding that he was getting worse he rested completely for about two months and at the end of that time he felt a little better, but was unable to walk properly or to perform small duties for himself such as buttoning his coat *et cetera*. He went out to the farm where he became worse again and as he tersely put it, he became a nuisance to himself and everyone else.

He came to Sydney and it was then seven months after the accident that I first saw him. He complained of burning in the hands and feet, inability to walk without a stick and then only a short distance, inability to fasten his coat or pick up small objects, an unpleasant sensation like velvet when touching anything; he also complained of pain in the calves of the legs.

On examination the pupils reacted to light and accommodation. The knee jerks were absent, sense of passive position and passive movement were impaired. Both epieritic and protopathic sensation were dulled. There was definite tenderness on squeezing the calf muscles. Foot drop was not a prominent feature; there was, however, a great deal of wasting of the *vasti laterales* and *vasti mediales* and *rectus femoris* muscles. The hands showed wasting of the thenar and hypothenar eminences. The grip was very poor and the condition was bilateral. A faradic response was obtained in all, but with great difficulty in the wasted muscles.

The late Professor Cushny in his textbook of pharmacology states that when the dose of arsenic is short of the fatal one, the patient frequently recovers from the acute symptoms only to develop those of chronic arsenical poisoning. He further states that arsenic is present in such tissues as the hair, the walls of the stomach, the cancellous tissue of the bones of the skull and the vertebrae long after it has disappeared from the urine.

Colonel Harrison in the *Medical Annual* of 1925 speaks well of sodium thiosulphate as an antidote for arsenic in the treatment of arsenical dermatitis and jaundice following the administration of "Salvarsan." And so it was thought that the failure of the patient to improve to any permanent extent might be due to the causative agent still being present in the body and being gradually changed into arsenious acid, the radicle which causes the arsenical symptoms. On this assumption 0.75 gramme of sodium thiosulphate dissolved in ten cubic centimetres of water was injected intravenously in the hope that a soluble arsenate would be formed and so excreted. Injections

were given on alternate days; the patient being kept in bed on the day of the injection.

A specimen of urine was collected two hours after the fourth injection, the chemical examination of which was kindly carried out by the Board of Health. Arsenic was found to be present in this specimen. A second examination was carried out at the end of the tenth injection, this time one specimen was saved before the injection and another two hours after. The first yielded no response to a test for arsenic, but the report on the second specimen taken after the injection was indefinite and so it was thought best to err on the safe side and six more injections were given.

The urine was again examined and this time no arsenic was found. During the first three weeks massage and electricity were employed. Clinically at the end of the tenth injection the patient had made tremendous strides; all pain had left, the velvety feeling in the hands had gone, he could walk without a stick and perform finer movements as putting links in his shirt *et cetera*.

A peculiar phenomenon of the injections was that, whereas the first five did not cause the patient any discomfort, those following gave a reaction almost focal in character; the hands and feet suffered from acute sensory disturbances, not even the sheet could be borne and all the symptoms seemed to be accentuated; this was alarming the first time it occurred, but the condition cleared up in about twelve hours and in twenty-four the patient was in a better state than before the injection.

At the conclusion of the treatment he was practically normal, in fact owing to an error he got into a wrong tram and was forced to walk a good mile and a half. He was allowed to transact what business he liked in the city before returning home and although a moderately strenuous week was spent, no evidence of relapse was detected. Nor has any been reported since.

To summarize:

1. Arsenic was found in a specimen of urine six months after a single large dose.

2. The arsenic disappeared from the urine within three weeks following the intravenous injection of sodium thiosulphate.

3. Rapid clinical improvement took place.

I have reported this case in order that those who have the opportunities, may more fully investigate the use of this drug in nerve affections caused by the ingestion of arsenic or any of the other heavy metals.

RETROBULBAR NEURITIS ASSOCIATED WITH SPHENOIDAL AND ETHMOIDAL SINUSITIS.¹

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Honorary Assistant Ophthalmic Surgeon, Royal Prince Alfred Hospital, Honorary Ophthalmic Surgeon, Lewisham Hospital, Sydney.

ON September 8, 1924, Mr. J. W., aged thirty-seven years, consulted me, complaining of headache over and behind the right eye for about two years. He was wearing glasses, prescribed one year previously. His visual acuity with the right eye was $\frac{1}{12}$ and with his glasses $\frac{1}{60}$, nearly. His visual acuity with the left eye was $\frac{2}{60}$ and with his glasses it was not improved.

The left eye was amblyopic, having a very high degree of myopic astigmatism. The left cornea was nebulous. He stated he had never seen with the left eye. Slight alteration of the axis of cylinder of the right glass gave him $\frac{1}{60}$ all. There was no fundal change. As he also complained of catarrh at the back of the nose and throat, I advised that he should see a rhinologist in regard to any possible cause of headaches in that field, but this he postponed.

¹ Read at a meeting of the Ophthalmological Society of New South Wales on February 21, 1927.

On October 20, 1924, he saw me again, stating that the sight had become blurred during the night and that the neuralgic pain about the right eye was worse. The vision of the right eye was $\frac{1}{12}$, and with glasses $\frac{1}{12}$. Fundal examination revealed nothing abnormal. The eye was tender on pressure and painful with movement. There was a very definite central scotoma for red and green. Pupil reaction was normal, the so-called "courtesy" reaction was not present.

A diagnosis of retrobulbar neuritis was made. The probable cause in light of his history was sphenoidal or posterior ethmoidal trouble. There was no story of injury, no other evidence of enlargement of the pituitary or of insular sclerosis or of acute myelitis, nor was there any history, suggesting toxic amblyopia (alcohol, tobacco, diabetes *et cetera*). He had taken a little "Aspirin" for his headache.

I prevailed upon him to have a second opinion. He saw Dr. R. H. Jones who concurred with diagnosis and probable aetiology.

On October 22, 1924, Dr. Dunn investigated his nose and reported: "No pus seen in nasal cavities on ordinary examination; both middle turbinals very large." I asked for the sphenoidal and posterior ethmoidal sinuses to be cleared out.

On October 23, 1924, vision was confined to the perception of hand movements.

On October 24, 1924, Dr. Dunn operated. He performed submucous resection of the septum; both middle turbinals were removed; the posterior ethmoidal cells on both sides were curetted; the right sphenoidal orifice was enlarged with forceps; no actual pus was detected, but the ethmoids were in a crumbly condition and very juicy.

On October 28, 1924, four days after the operation, the patient read the top print on the bed temperature charts. He was having nasal douches of warm saline solution.

On November 4, 1924, he was discharged from hospital with vision $\frac{1}{4}$ all.

On February 26, 1925, the patient saw Dr. Dunn, complaining again of headache and pain behind the right eye of one week's duration. The eyesight was not affected. The nose appeared clean. Trichloroacetic acid, one part in three, was applied to the right sphenoid.

On March 11, 1925, headache was much improved. Trichloroacetic acid was again applied to the right sphenoid.

On March 16, 1925, the headache was relieved. Trichloroacetic acid was again applied to the right sphenoid.

On November 11, 1926, two years after retrobulbar neuritis, the patient reported to me "just for an overhaul of the right eye." The sight of the right eye had kept quite well and no headaches had occurred since the last treatment. Vision of the right eye was $\frac{1}{12}$, with glasses $\frac{1}{4}$ all. He recognized the smallest red and green on Cruise's scotometer in a normal manner.

Comment.

Of course it is impossible to state whether the complete recovery from the retrobulbar neuritis after the sinus operation was *post hoc* or *propter hoc*, but the latter is more than probable, especially in view of subsequent similar headache, responding so readily to treatment of the sinuses.

If *propter hoc*, it may be emphasized that the sinuses in question should be cleared out, even though no pus is seen in nasal cavities on ordinary examination.

Reviews.

THE HAND AND INFECTION.

"INFECTIONS OF THE HAND," by Lionel R. Fifield, has been written primarily for students, house-surgeons and practitioners as stated in his preface.¹ All general surgeons, general practitioners and especially medical officers

¹ "Infections of the Hand," by Lionel R. Fifield, F.R.C.S. (England); 1926. London: H. K. Lewis and Company, Limited. Crown 8vo., pp. 198, with illustrations. Price: 9s. net.

attached to large works, will also find this small book a useful adjunct to their armamentarium. Fifield has wisely omitted his detailed anatomical investigations to keep the book within moderate limits. The forty pages on the anatomy of the hand, presented from the surgeon's point of view, make the subject interesting and useful to the general practitioner and he is able quickly to refresh his memory and retain dry facts erstwhile so easily forgotten as taught by the pure anatomist.

The chapters on infections of the fingers and palms of the hand and the complications that may occur, are written in a lucid manner. The subject matter is made easy to follow by the insertions of the numbers of the diagrams in parentheses following the description of the conditions.

Fifield stresses the need of careful clinical examination before the patient is anesthetized and the fact that a general anesthetic is necessary in the treatment of all infections of the hands, excluding only the subcuticular conditions. This opinion we heartily endorse. His methods of treatment are simple and excellent. We are pleased to observe his strictures on the use of the rubber tube in drainage in suppuration in the hand.

The lymphatic infections are dealt with concisely and efficiently. We would, however, have liked to have seen a larger initial dose of antistreptococcal serum advocated in serious cases.

Much sound advice, evidently gained from practical observant experience, is contained in his little book. If medical practitioners learn the principles inculcated therein and carry them into effect, it will be to the benefit of their patients.

FUNDAMENTALS OF TEACHING IN HEALTH.

THE necessity for each individual to take an intelligent interest in and to cooperate with all efforts directed towards the improvement of the public health is the fundamental contention in "Health, a Textbook for Schools," by M. Avery.¹

This attitude can be obtained only by substituting knowledge for ignorance so that an enthusiastic support of such efforts will replace the usual apathy and indifference. This implies education and since the ideal opportunity for education is during school life, the most rational scheme is to lay the foundations of health knowledge during this period.

The aim of the author is, therefore, to make this book a school book, but it is something more than that. It can be read profitably by any lay person, whilst the chapters which trace the stimulating progress of public health will not leave a medical reader unmoved. The facts of this history and the individuals who guided each attainment to fruition are presented to the reader in an interesting and accurate manner. The various conditions which are necessary for health are dealt with concisely and the statement of any scientific fact is usually followed by an explanation of the principles which are involved. Bacteriology, biology including heredity and evolution, the relation of insects and animals to disease and similar topics are all touched upon in dealing with the causation and control of disease.

There is a chapter on elementary physiology, on food and drink and on first aid. One of the few exceptions which can be taken, is in connexion with the advice on fractures. An elementary knowledge of first aid is no justification for an attempt to set a fracture. The advice given in the case of a fractured femur, "Pull the foot gently till injured leg is of the same length as the other," may prove disastrous in the hands of an inexperienced enthusiast.

On the whole the book is well adapted for the purpose in view and except for the fact that its general arrangement is more along the lines of standard English public health books, it should prove an excellent textbook for Australian schools.

¹ "Health: A Textbook for Schools," by M. Avery, B.Sc. (London), M.R.San.I.; 1926. London: Methuen and Company, Limited. Post 8vo., pp. 233, with illustrations.

SURGERY OF THE KIDNEY.

Mr. F. MCG. LOUGHNAME, in "A Handbook of Renal Surgery"¹ endeavours to present to the student* and general practitioner in a concise manner a complete and up-to-date knowledge of renal surgery. He starts with a description of renal anatomy and then passes on to urinary examination. In this the various elements are considered from a macroscopical rather than a microscopical standpoint. The subject of bacteriuria, for instance, is disposed of by the statement that: "In bacteriuria the urine is turbid and does not become clear even after being centrifuged."

In dealing with inflammatory conditions of the kidney some statements are made which are not in accord with the generally accepted teachings, but as the author himself explains, the views expressed are those that he has from his own experience found most satisfactory. He endeavours throughout to avoid discussion.

From the standpoint of the urologist the book contains nothing new or original; however, it is not intended for the specialist, but as a guide for the student and general practitioner. Even if read as such, a more comprehensive work would undoubtedly justify the extra time taken for its reading.

A TREATISE ON HYDROGEN ION CONCENTRATION.

In the eighth of the series of Medicine Monographs, Austin and Cullen have gathered together in brief space the main facts concerning the hydrogen ion concentration of the blood in health and disease.² The authors have concerned themselves only with the results of more recent work which may be of importance in clinical medicine and have not attempted to review exhaustively and analyse critically the now vast literature of this subject. They commence with a short account of the control of the normal acid-base balance of the body and after indicating the normal values of pH of the plasma and the other body fluids, pass on to a discussion of the changes in the pH of the plasma under various abnormal conditions.

They summarize the effects of the introduction into the body of acids, of calcium and ammonium chlorides and of bases in excess. Changes in the acid-base equilibrium in renal disease are admirably treated, recent work appearing to show that factors other than phosphate retention may be concerned.

The important part played by capillary poisons in producing acidosis is emphasized and the influence of anoxemia, of the accumulation of lactic acid and of anaphylactic and traumatic shock are briefly treated.

The section on tetany is particularly interesting. The authors point out that this condition may be associated with destruction, removal or disease of the parathyroids, with increased alkalinity of the serum and with diminished concentration of phosphates. There appears to be a definite relationship between the two last mentioned conditions and the pH of the plasma which cannot be accounted for directly by the influence of pH on the calcium concentration.

Other sections are concerned with the changes in the acid-base equilibrium in surgical anaesthesia, in pneumonia and in some other infections and in pregnancy. The acidosis following ethylene-oxygen and nitrous-oxide-oxygen anaesthesia appears to be definitely less pronounced than that following the administration of ether. But there is no clear evidence that either the lowering of alkali reserve and of pH or the frequently observed appearance of ketonuria has any definite clinical significance. The small changes which have been observed in pneumonia and in the later months of pregnancy also appear to be of no

particular importance and in the latter are probably due to some increase in pulmonary ventilation.

Finally the authors briefly describe the various methods for the evaluation of the pH and the book concludes with a useful bibliography.

HIGH BLOOD PRESSURE.

TEN years or so ago accurate measurement of the arterial blood pressure was not commonly undertaken in routine clinical work. In cases of chronic nephritis the sphygmomanometer was occasionally used and the systolic pressure estimated by the tactile method. Gradually the auscultatory method described by the Russian physician Korotkoff in 1905 has become universally adopted and now accurate measurement of systolic and diastolic pressure is made in a great variety of cases. Indeed, to "suffer from blood pressure" is becoming a very popular complaint and patients often ask their doctors to measure the pressure. The sphygmomanometer takes its place alongside the stethoscope and thermometer as an essential part of the physician's equipment.

The second edition of Dr. Halls Dally's "High Blood Pressure: Its Variations and Control"¹ has now appeared and this book provides a useful review of the most recent work on high arterial pressure and the diseases of which it is a symptom.

Various types of blood pressure instruments are considered. Those of the "Baumanometer" type appear to be the best of the mercurial manometers; the aneroid manometers are convenient for carrying about and of these the most favoured are the "Tycoos" and similar instruments. It is important to test the aneroid types against the mercurial manometer at intervals, to insure reliable readings.

The author deals fully with the technique of sphygmomanometry and describes in detail the now well-known auscultatory method. The five phases discernible by this method are clearly outlined. The beginning of the first phase marks the systolic or maximum pressure in the artery being compressed. It is important to make at least three readings of this point in order to insure the subsidence of vascular hypertonus. As the pressure in the bag is lowered, the clicking sounds of the first phase are replaced by the murmurs of the second; while these in turn give way to the loud clear sounds of the third phase. The point at which these loud sounds are succeeded by the dull muffled sounds of the fourth phase, marks the diastolic pressure. The change from this fourth phase to the fifth or silent phase is of no significance, although some of the life insurance companies wrongly instruct their examiners to regard this point as the diastolic pressure.

The author is at pains to describe what he terms "the complete arterial pressure picture" and its plotting on graph paper. Such complicated procedures are unnecessary. It is quite sufficient to record the systolic and diastolic pressures and the pulse rate at the time.

In common with most writers on blood pressure Dr. Halls Dally appears compelled to formulate a new "simple rule for calculating the standard" systolic and diastolic pressure. His rules, however, are as arbitrary and complicated as the others. So great are the variations in blood pressure found in healthy people that it would appear unnecessary to alter the time-honoured rule of "one hundred plus the age in years" as indicating the upper normal limit for systolic pressure and two thirds of this figure as the upper normal limit for diastolic pressure.

Attention is drawn to the various fallacies to be guarded against in measuring blood pressure. Especially is it necessary that the subject be in a state of physical, mental and psychic repose. The late Lauder Brunton recorded how an annoying incident once caused his systolic pressure, normally 120, to ascend to 160 and concluded the description in his precise way: "the increase amounted to no less than one-third my normal."

¹"A Handbook of Renal Surgery," by F. McG. Loughname, F.R.C.S.; 1926. London: Longmans, Green and Company, Limited. Demy 8vo., pp. 225, with illustrations. Price: 10s. 6d. net.

²"Hydrogen Ion Concentration of the Blood in Health and Disease," by J. Harold Austin and Glenn E. Cullen; 1926. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 86, with illustrations. Price: \$2.00 net.

¹"High Blood Pressure, its Variations and Control: A Manual for Practitioners," by J. F. Halls Dally, M.A., M.D., B.Chir. (Cantab.), M.R.C.P. (London); Second Edition; 1926. London: William Heinemann (Medical Books) Limited. Royal 8vo., pp. 212, with illustrations. Price: 12s. 6d. net.

In reviewing the physics of sphygmomanometry, the author introduces some new terms, for which favour the already overburdened medical student will hardly be grateful. "Hyperdynamia" and "hyperachthia" are doubtless soundly derived from the Greek, but surely "increased driving force of the heart" and "increased peripheral resistance" are quite sufficiently explicit?

In considering treatment, Dr. Halls Dally classifies cases of high arterial pressure into simple (hyperpiesia of Allbutt), cardio-vascular and renal groups. In addition to psychotherapy, dieting and the removal of septic foci, an extraordinary variety of measures is recommended: Massage, X rays, high frequency and diathermy, ultraviolet rays, lumbar puncture, venesection, drugs, hepatic extract and the Steinach operation.

Other chapters in this comprehensive review deal with blood pressure measurements in relation to pulmonary tuberculosis and to life insurance. The history of sphygmomanometry is sketched and a large bibliography is provided. The value of blood pressure readings in surgery is mentioned, but not considered in detail.

The most debatable aspect of sphygmomanometry is the interpretation to be placed upon the readings. Mackenzie's statement aptly sums up the matter: "All the manometer is capable of doing is to indicate approximately the amount of pressure necessary to obliterate the artery to which it is applied; all the rest is inference." This is not to say, of course, that the inference may not be well founded.

Dr. Halls Dally certainly gives an ample statement of the various opinions on high blood pressure conditions. Whether, however, the average doctor will derive much benefit from studying the subject so fully is very doubtful. A small and more concise book would probably better suit the needs of the practitioner.

PHYSIOTHERAPY.

"PRACTICE OF PHYSIOTHERAPY," by C.H. Sampson, is an enlarged second edition of "Physiotherapy Technic" which appeared in 1923.¹ In his preface the author draws attention to the fact that many hospitals and universities in America have established courses in this branch of medical education. He warns against the "gyp," the "foozlewurt," whatever they may be and urges their elimination.

Part I. deals with the physics and technique involved and describes with much detail the various machines and appliances and their application. The account is apparently that of a man who has had a very large experience in his subject. The author writes with the ease and volubility of one who has so much to say and so feels the necessity of saying it, the difficulty with him is to know not what to include, but what to omit.

Part II. deals with the clinical applications and is an alphabetical list of pathological conditions with the recommended therapy. The treatment would be possible in the majority of cases only in a well equipped physiotherapy department.

Although the volume is invaluable to the practitioner who is using the more modern physical remedies, as it abounds not only in useful points as to "what to do," but also in the more important "what not to do." The chapter on "Trouble Shooting," that is, investigating the cause of breakdown in electrical appliances is one likely to be of the greatest use to the man who is forced to find the cause of a breakdown himself; a position not many medical men would wish to occupy.

BONE DISEASE.

MR. LAWFORD KNAGGS, Professor of Surgery at Leeds University, goes into retirement and takes the suggestion of a young colleague to devote his spare time to writing a book on bone diseases.

Would that more men, in like circumstance, might be induced to follow this excellent example. Had Mr. Knaggs not retired, he might have left a few more grateful patients. But by retiring and taking up a definite field of study he has done a service to the commonwealth of medicine which will react to the advantage of a host of future grateful patients.

In choosing bone disease and treating it mainly though not exclusively from the pathological side, Mr. Knaggs enters a very poorly cultivated patch in the field of medicine. His worthy labours yield us "The Inflammatory and Toxic Diseases of Bone."²

Straining a point here and there, he has been able to survey most of the known bone conditions under this title.

Included in the volume are two chapters on *leontiasis ossea* and *osteogenesis imperfecta*, which he admits do not properly fall under his title. These are done in such first rate fashion that they deserve to become little classics. They make us regret he had not found time to cover the whole ground of bone disease.

For the rest his survey embraces the following main subjects, osteomyelitis, tuberculosis, syphilis and yaws of bone, *arthritis deformans*, pulmonary osteoarthropathy, rickets, scurvy, *osteitis fibrosa*, osteomalacia, *osteitis deformans*, syringomyelia and Charcot's joints.

On these subjects he has carefully compiled the work of others, paying tribute due to original and classical descriptions. He has added much original matter from his own clinical experience and from a painstaking study of the rich resources of the museum of the Royal College of Surgeons. In the latter and especially in the photographs of microscopical bone sections which accompany the descriptions, lies the great and abiding value of his work. All keen students will turn to this information most gratefully. No one could read his chapters on osteomyelitis, for instance, without feeling that his next patient with this disease would be better treated by reason of the clearer pathological pictures he had acquired.

In addition to compiling old and collecting new facts he also compounds certain tentative hypotheses. These have a suggestive value, but they would appear to have a bias towards bringing most of the known bone diseases under the heading of inflammatory and toxic. The reader feels the strain of this bias, when he finds that under the heading of serous osteomyelitis the author frankly places and describes Perthes's disease of the hip, and Köhler's disease of the scaphoid. An equally good case might be made out for these conditions being traumatic; an equally good case can be made for them being rachitic. Even if the latter were true, as the Vienna school teaches, Mr. Knaggs would still have them caught in the toxic portion of his title. For we find him bearing heavily towards the toxic theory of rickets and scurvy. For example: "Should the view that rickets is produced by the action of metabolic toxins eventually prove to be sound, there can be hardly any doubt that scurvy will fall into the same category and the antirachitic and antiscorbutic vitamins will come to be regarded as antitoxins." Surely this is straining away from the mass of evidence which indicates these two conditions as directly due to vitamin and sun deficiency.

Be that as it may, there are others of his views in which true illumination is found. For example: "There is good reason to believe that the pathogenesis of such diseases as rickets, osteomalacia, *osteitis fibrosa* and *osteitis deformans*, is allied." This is wholly admirable; it is the result of his profound pathological research; it is a glimpse of the vision splendid which will some day enable us to correlate and cure what are now diverse and intractable clinical entities. We can prevent and cure rickets, why can we not prevent and cure osteomalacia, *osteitis fibrosa* and Paget's disease by applying similar principles?

¹"A Practice of Physiotherapy," by C. M. Sampson, M.D.; 1926. St. Louis: The C. V. Mosby Company; Melbourne: W. Ramsay. Demy 8vo., pp. 620, with illustrations. Price: 50s. net.

²"The Inflammatory and Toxic Diseases of Bone: A Text-book for Senior Students," by R. Lawford Knaggs, M.C. (Cantab.), F.R.C.S., with photomicrographs by G. H. Rodman, M.D., Hon. F.R.P.S.; 1926. Bristol: John Wright and Sons Limited. Royal 8vo., pp. 428. Price: 20s. net.

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The Dunedin Congress and After.

It is no mere platitude when the assertion is made that the second session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927, was a triumph in organization. The scientific work was planned on a scheme that is at once compelling in its logical basis, stimulating and ingenious. The scheme was devised by Dr. D. W. Carmalt Jones, the Honorary Treasurer. The first of the four days was devoted to the discussion of a topic of local interest. This subject was goitre. The second day was largely taken up by discussions on matters of special importance to Australia. The choice fell in the first place on hydatid disease. Subjects of general interest were handled on the third day, while the presentation of new work was reserved for the fourth day. Dr. Carmalt Jones has asked the Executive Committee to consider the proposal to perpetuate this scheme and it is anticipated that the Executive Committee will forward it to the Federal Committee with a strong recommendation that it be adopted. The application of the scheme and the general organization of the session were in competent hands. Professor W. P. Gowland, the Honorary General Secretary, and Professor A. M. Drennan, the Honorary Associate Secretary, prepared and arranged a most attractive and valuable scientific programme.

Dr. Carmalt Jones has gone further in his proposals by suggesting that a longer time should be given to the preparation of future sessions in order that investigations into selected subjects may be carried out with deliberation and coordinated effort. He would wish the preparation of a session to begin six years ahead. To give effect to this proposal the Federal Committee would have to issue invitations at once for the third session to be held three years hence and for the fourth to be held three

years later than the third. As soon as an invitation is accepted, the medical profession in the State or part of the Dominion where the session is to be held, would elect its Executive Committee and start the research work into the chief problems selected for discussion without loss of time.

The organization of a session under ordinary circumstances costs a considerable sum of money. If this organization is to include the planning and coordination of research work, the sum at the disposal of the Executive Committee would have to be larger. To meet this difficulty and incidentally to place the small States in a more favourable position than they are at present, Dr. Carmalt Jones has evolved the idea that before a Branch issues an invitation to hold a session of Congress in its chief city, all the members of that Branch should be required to undertake to enrol as members of that session. The members of the inviting Branch would be required, instead of paying a membership fee for Congress of two guineas, to contribute one guinea a year for three years, the third guinea to be earmarked for the investigation work outlined above.

The proposal is worthy of serious consideration. It is an ingenious expedient to build up a substantial fund for future sessions of Congress. Its success must depend on the willingness of each individual member of the Branches concerned in the organization of successive sessions of Congress to contribute voluntarily a guinea a year for three years. It will be remembered that the Victorian Branch refused to call upon its members to pay an additional sum of ten shillings a year to enable the Australasian Medical Publishing Company, Limited, to increase the size of the issues of this journal from a minimum of twenty-four to a minimum of forty pages. If it is found that the Branches are not prepared to call upon their members to bear this heavier burden from time to time, an alternative suggestion might be put forward. If every Branch of the British Medical Association in Australia and New Zealand raised its subscription by five shillings a year for the purpose of carrying on the scientific work of the Congress, the Federal Committee would be able to hand over to the Executive Committee of

the next session a sum approaching £4,000 and on each succeeding occasion a still larger sum. At the present time there are about 4,800 members of the Association in Australasia. The annual increase amounts to about 280 members. This method would bring the Congress into line with the Annual Meetings of the British Medical Association to which every member has a right of entry without extra subscription. The inviting Branch would be required to call for voluntary contributions for social functions and entertainments, for the moneys of the Branches and of the parent Association cannot be used for such purposes. It would enhance the value of membership of the British Medical Association in Australasia, since the portals of this relatively new institution, The Australasian Medical Congress (British Medical Association), would be thrown open to all members.

Current Comment.

TICK PARALYSIS.

IN 1924 E. W. Ferguson reported in this journal the history and *post mortem* findings in a case of death from tick paralysis. The patient was a male, aged sixteen years. He pointed out that, although paralysis following tick bites is not uncommon in human beings, death has rarely been reported. He collected records of several cases of death. In one instance only was the variety of tick, *Ixodes holocyclus*, determined. This is the species which is known to be responsible for paralysis and death of dogs. Ferguson carried out a series of animal experiments by the injection of emulsion of brain and spinal cord, but no paralysis was produced. He showed that death in several instances was due to respiratory paralysis, in the remaining cases the information available did not enable him to form any conclusion in this regard. He pointed out also that it was uncertain whether the paralysis was due to a toxin or to an infection, bacterial or protozoological, but that recent views favoured the occurrence of a toxæmia due to a poison secreted by the tick itself.

Some experimental work has recently been carried out on this subject by I. Clunies Ross at the Veterinary Science Department of the University of Sydney.¹ In all his experiments Ross worked with *Ixodes holocyclus*, reared in the laboratory mostly from immature stage recovered from *Perameles nasuta* (the bandicoot) captured near Sydney. He found that the period elapsing between the attachment of the tick and the onset of the symptoms was inconstant, that it corresponded to the stage of the tick's engorgement, rather than to

a period of time. A rise of temperature occurs and this is followed by incoordination affecting the hind quarters. In contrast to the severity of the motor disturbance other symptoms are slight. Death in all cases is due to respiratory paralysis.

In discussing the pathological changes, Ross points out that the sensory paths apparently remain intact. The toxin thus acts upon the central nervous system, in other words upon the motor neurones in the anterior horn. The undisturbed consciousness or attention indicates that the cortex is not seriously affected. In order to determine whether the toxin acts peripherally, Ross anaesthetized a normal dog, exposed certain spinal nerves and stimulated them with a Faradic current. The points along the nerve at which separation of the primary from the secondary induction coils failed to produce any obvious response on stimulation, were noted. A similar series of nerves were exposed in a dog which was in the advanced stage of tick paralysis. Stimulation along the nerves of the second dog produced a normal and powerful response. This result indicates to Ross that the toxin does not act peripherally and, since there is little evidence that the cortex is affected, that the motor neurones in the anterior horns and the nerve cells of the cranial nerve nuclei are chiefly involved. It is to be noted that workers in this field have failed to record the presence of specific lesions in this condition. In the case to which previous reference has been made, Ferguson failed to find changes other than engorgement of the vessels, newly formed capillaries and infiltration with small round cells in either brain or spinal cord. In the latter he found some small hæmorrhages. Ross raises the question as to why more definite lesions are not found in the spinal cord of animals dead of the disease. He points out that in view of the fact that no permanent or even prolonged disturbance of function is ever observed in animals recovering from the disease, distinct degeneration or death of the nerve cells can scarcely be expected to occur prior to the animal's death. It is argued, therefore, that in tick paralysis death of the nerve cells does not precede the animal's death, but that this depends directly on respiratory paralysis. When the toxin is neutralized or eliminated before respiratory paralysis is produced, rapid recovery of function follows.

As already pointed out two hypotheses have been advanced in regard to the cause of tick paralysis. These are discussed by Ross. In support of the view that the causal agent is a living organism Hadwen and Nuttall have pointed out that in experimental tick paralysis no symptoms are manifest until the tick becomes nearly replete after being on the host for six days. This was confirmed by Dodd and also by Ross. It has been inferred from this that the causative agent must undergo a period of incubation similar to that which is frequently observed in diseases of bacterial or protozoal origin. Moreover, the absence of ill-effects, occasionally observed when ticks feed on susceptible animals, has been attributed to these ticks being non-infective. In support of the toxin hypothesis Hadwen and Nut-

¹ *Parasitology*, December 14, 1926.

tall failed to find any organism in blood smears and were unable to transmit the disease from affected to healthy animals. Ferguson's findings in this regard have already been mentioned. Ross was unable to discover any causal organism in the blood or body fluids or to transmit the disease to other dogs by subcutaneous, intravenous or intraperitoneal inoculation of blood, cerebro-spinal fluid or emulsions of nerve tissues and the injection of intestinal contents of ticks which had caused fatal attacks, also had no effect. The close relationship between the stage of the engorgement of the tick and the onset of symptoms of paralysis make it appear that some change in the physiological activity of certain organs of the tick during the final rapid stage of engorgement is responsible for the production of the toxic agent. Ross has made dissections of the salivary glands of *Ixodes holocyclus*. He finds that two types of alveoli are present and that the appearance of the gland varies considerably according to the stage of the engorgement of the tick. Nuttall and Strickland showed that the salivary glands of *Argas persicus* contain an anticoagulin. By using a technique similar to that of these observers, Ross has found that emulsions of salivary gland taken from partially gorged ticks, when mixed with equal or double quantities of blood, prevent coagulation for more than two hours. He could find no evidence of the presence of a hæmolysin. He then sought to discover whether a definite toxin could be demonstrated in the salivary glands. He carried out some experiments by the injection into dogs of emulsifications of salivary glands, removed as far as possible under sterile conditions. In one animal he was able to produce definite though transitory effects. He raises the question as to whether the symptoms were due to injected toxin or to foreign protein action. He concludes that the former caused the symptoms, because no change was produced in animals which received a larger dose of protein than did the animal which manifested the symptoms. At the same time he points out that the dose of salivary gland received by the animal was small and would have to contain an exceedingly potent toxin to produce distinct symptoms.

Ross is careful not to place too much reliance on the result of a single experiment. He recognizes that more work will have to be done on this subject before the whole story is told. He points out that if it be accepted that the causal agent of the disease is a tick-derived toxin, it remains to be shown how such toxin is produced. Data are at present lacking to permit of a comparison between the toxicity of snake venom and the toxin present in certain ticks. He regards this as a subject worthy of investigation.

THE STREPTOCOCCUS IN POLIOMYELITIS.

MUCH work has been done on the causation of epidemic poliomyelitis, but so far the identity of the responsible organism has not been determined. On the one hand Flexner and Noguchi have

described the so-called globoid bodies in connexion with this disease; the disease has been transmitted to monkeys. It will be remembered that Lynch succeeded in finding these bodies during the recent epidemic in New Zealand in cultures from human and experimental poliomyelitis. On the other hand E. C. Rosenow has for some years been endeavouring to establish a causative relationship between a streptococcus and the disease. In 1918 he reported the results of the treatment of fifty-eight persons with immune horse serum. He has been working on the subject ever since. In the issue of April 11, 1925, reference was made to his elaboration of a precipitin test in which the clear extract of nasopharyngeal washings or swabbings was layered over antistreptococcic horse serum used in the treatment of the disease. Results which were inconclusive, were obtained. In discussing his results, Rosenow claimed that the presence of a precipitin reaction was not without significance, but that it still had to be decided whether the presence of a reaction indicates the presence of a true virus in addition to that of the streptococcus.

Rosenow and A. C. Nickel have recently published the results of the administration of antistreptococcic serum to several groups of patients.¹ The injections were given intravenously or intramuscularly. In a series of 109 patients treated by themselves the diagnosis was reasonably certain. Thirty-one were not paralysed at the time of the first serum treatment, twenty-five were suffering from slight and fifty-three from moderate or severe paralysis. Of the first group one died, of the second one and of the third group nine died. Four of the patients were moribund at the time of treatment and allowing for this, the mortality was 6.6%. Of the residual patients all in the first group recovered without paralysis, of the second group twenty-one were free from paralysis, two had slight and one had moderate paralysis and in the third group twenty-four had no residual paralysis, in eight the paralysis was slight, in ten it was moderate and in two it was severe. In ninety-four of the series there was a noticeable change for the better within twenty-four hours of injection. Rosenow and Nickel also give the results obtained by other practitioners in the treatment of 1,113 patients with serum and contrast these with the results from 278 untreated patients. The results were in every way superior in the first group. They conclude that the curative action noted clinically would seem attributable to the specific antibodies contained in the serum and not to non-specific or foreign protein effects. No importance can be attached to results of treatment of this kind. Rosenow and his colleagues have yet to establish that the streptococcus can be recovered from every or nearly every patient suffering from poliomyelitis, that the same organisms can give rise to a similar illness of monkeys, that this particular variety of streptococcus has a special affinity for the cells of the anterior horns of the spinal cord and that it does not induce illnesses of another character.

¹ American Journal of Diseases of Children, January, 1927.

Abstracts from Current Medical Literature.

MEDICINE.

The Effects of an Exclusive and Long-Continued Meat Diet.

C. W. LIEB (*Journal of the American Medical Association*, July 3, 1926) has subjected the famous explorer, Vilhjalmur Stefansson, to an exhaustive medical examination with a view to determining what evil results, if any, may have followed long periods of subsistence upon meat. Stefansson at forty-three years of age is in every way a normal, healthy man. He lived for over eleven years in the Arctic circle and for periods aggregating over nine years he ate a diet consisting entirely of meat (*caribou et cetera*). He reached his maximum weight whilst living on this food and his sense of physical and mental fitness was at its highest. The meat diet agreed with him in hot or cold weather and whether he was active or idle. His hair thickened and his scalp became healthier. He had no dental caries. Stefansson, for a space of three years observed no case of constipation among six hundred meat-eating Eskimos. At the time of Lieb's investigation the explorer's systolic blood pressure was 115 millimetres of mercury and his diastolic pressure 55 millimetres. A laboratory examination of blood, urine, *faeces et cetera* and estimations of basal metabolism and renal function disclosed nothing in any way abnormal. Lieb concludes that these results will call into question the accepted theories regarding the dangers of high protein diets.

Ætiology of Epilepsy.

E. TILMANN (*Deutsche Medizinische Wochenschrift*, September 17, 1926) maintains that the cerebral cortex is abnormal in all cases of genuine epilepsy. Increased intracranial tension and chronic inflammatory changes in the arachnoid were noted in 75% of cases. Chemical analysis of the cerebro-spinal fluid shows also that inflammatory changes have occurred. The author considers that these changes are the true cause of the epileptiform attacks. While they have been noted in traumatic epilepsy no observations on idiopathic epilepsy have been so far made. The changes in the meninges are so slight that they are usually seen only during an operation and not *post mortem*.

Postoperative Pulmonary Complications.

N. B. GWYN (*The Canadian Medical Association Journal*, July, 1926) reported some data collected at Toronto General Hospital in connexion with pulmonary complications following operation. Massive collapse of the lung should be considered when rapidly formed consolidation of the lung occurs after operation. Minor embolism of the lung occurs often in association with femoral or abdom-

inal thrombosis and also without any evident phlebitis. Pleurisy or other conditions occurring four or more days after operation are often due to emboli. Postoperative pneumonia is usually evident two or three days after operation. It appears that aspiration of blood, of secretions or of a foreign body is the commonest cause of pulmonary abscess following operations on the oral, nasal or pharyngeal cavities, but pulmonary abscess does follow lobular pneumonia and septic embolism of the lungs at times. Effusion is rare except when associated with septic infarction and lung abscess. Abdominal operations are most often followed by pneumonia, "minor emboli," pleurisy or gross fatal emboli. Most postoperative pulmonary complications occur within a few hours of operation, bronchitis, bronchopneumonia, massive collapse and fat embolism being the commoner forms; the mortality is 20% to 60%. Pleurisy is a frequent diagnosis, often due to embolus from a femoral or unrecognized abdominal vein thrombosis; these conditions often arise during an afebrile period. Gross emboli following thrombosis often occur, especially after operations on the lower part of the abdomen. Pelvic or femoral thrombosis associated with fever is the common precursor. These emboli generally occur in the first or second week of convalescence and are usually fatal.

Calcium Metabolism.

A. T. CAMERON (*The Canadian Medical Association Journal*, July, 1926) discusses the practical application of present day knowledge of calcium metabolism. Infantile rickets, adult rickets (*rhachitis tarda*), osteomalacia and defective tooth formation may be caused by disorder of calcification. Deficient calcium or phosphate or vitamin D may cause rickets. Vitamin D is present in quantity in cod liver oil and less so in milk and egg yolk. In rickets there is low serum calcium (six milligrammes per ten cubic centimetres) and serum phosphate; these elements are lost from the body. Sunlight, cod liver oil and ultra-violet light all cure rickets by reestablishing normal calcium and phosphate metabolism. Tetany, a hyperexcitability of the nerve muscle system, occurs in rickets, parathyroid deficiency from surgical or other causes, feeding with sodium or potassium phosphate or large amounts of sodium bicarbonate, pyloric stenosis or when much hydrochloric acid is lost by vomiting, in severe diarrhoea rarely and following injection of guanidine. Serum calcium is deficient in tetany and calcium, hydrochloric acid and milk or cod liver oil will relieve the condition. Alkalosis is a factor in some forms of tetany, for example, when sodium bicarbonate is ingested in excess or when hydrochloric acid is lost in excess as in vomiting of children. Collip showed in 1925 that a concentrated product of the acid hydrolysis of parathyroid glands injected into animals in tetany following parathyroidectomy prevented

tetany and raised plasma calcium to a normal level. Large doses raised the calcium much above normal and caused atony, anorexia, ataxia, vomiting and death. Some good clinical results have been obtained with this extract of parathyroid gland. It is probable that an internal secretion of the parathyroid gland controls calcium metabolism. Calcium by mouth must be given repeatedly and frequently to produce any increase in serum calcium. Serum calcium is lowered in chronic nephritis and pneumonia; changes in serum calcium in other conditions are slight or doubtful.

The Bacteriophage.

D. M. COWRIE (*Annals of Clinical Medicine*, July, 1926) reports some observations on the bacteriophage. In 1896 Hankin showed that the water of the Jumna and Ganges rivers contained some substance which destroyed cholera organisms. In 1915 Twort, in cultivating glycerinated calf vaccine on agar, found that a transparent substance appeared on the agar which, in a dilution of one in a million, prevented growth of the micrococcus which grows from calf vaccine. He also showed that this transparent substance did not grow by itself, it was a disease of the micrococcus, it reduced the cocci to a finely granular state, it resisted a temperature of 52° C. and was destroyed at 60° C. It was found in the stools of dogs with distemper and of infants with diarrhoea. In 1917 D'Herelle found that the stools of a patient with dysentery (at the beginning of the convalescence) contained a substance which prevented the growth of young cultures of Shiga bacillus. He cultivated the faeces on broth and a profuse growth of Shiga bacilli occurred, until the patient was afebrile and convalescing. At this stage the culture tube was found to be sterile; he inoculated this tube with active Shiga bacilli and after twelve hours incubation it was again clear. He added one drop of this culture to a culture of Shiga bacilli and the culture became clear. He concluded that this lytic principle multiplied, appearing as clear spaces on agar containing fine points, he called the substance bacteriophage. An actual bacterial cell was necessary to its growth. It is maintained that the substance mentioned by Hankin, Twort and D'Herelle is the same. Cowrie confirmed some of D'Herelle's work, showing that bacteriophage would destroy colon and other organisms, but some organisms were resistant to it. The bacteriophage from a patient with dysentery was virulent for the laboratory strain of Shiga bacillus first, then for the Shiga strain of the particular patient and finally for *Bacillus coli*, *Bacillus typhosus* and paratyphoid bacillus A and B. D'Herelle reported cures of bacillary dysentery, enteric fever and paratyphoid fever and colon bacillus infections by subcutaneous injections of bacteriophage filtrate. Small doses of 0.25 cubic centi-

metre quickly produced immunization. Cowrie isolated bacteriophage from horse manure and sewer water, the latter being most effective. Also it was obtained in scarlet fever, chicken pox, measles and enteric fever from the stools. He has employed it therapeutically in eleven cases of pyelitis and the urine became sterile in all cases but one in three to fourteen days and remained sterile for six to seventy days. Symptoms and bacilli returned in some cases, but a second bacteriophage treatment caused the urine to become sterile again in three instances. It is pointed out that a damaged kidney is liable to reinfection. The dose in these cases is 2.5 to 3 cubic centimetres on three successive or alternating days. The bacteriophage appears in scarlet fever at the time when cure is taking place and disappears when convalescence is established, but this bacteriophage has no action on the hemolytic streptococci found in the throats of the scarlet fever patients. Cowrie holds that the organism causing the infection must be isolated and the bacteriophage must be found to be lytic to the organism *in vitro*. He finds no benefit from oral administration in any case and in enteric fever neither subcutaneous nor large oral doses give any relief. This disagrees with the conclusions of other workers.

Prevention and Treatment of Scarlet Fever, Measles and Diphtheria.

D. O'HARA (*Boston Medical and Surgical Journal*, September 16, 1926) can detect no great improvements in the therapeutics of diphtheria during the past ten years. Antitoxin is curative when used sufficiently early, but the morbidity and mortality are still, he thinks, too high, though they will be lowered in time by preventive treatment. Weaver has suggested the immediate use of antitoxin in all suspected cases without the usual delay involved in the examination of cultures. Weaver also recommends the use of nothing but 10,000 unit packages of antitoxin. He holds that the small dosages now employed should be discontinued. All patients with scarlet fever should be given the scarlet fever antitoxin at the earliest opportunity. It is useless if given after the fading of the rash or to combat septic complications. The antitoxin may be administered intramuscularly or intravenously. All patients should be tested for sensitiveness to horse serum and desensitized, if necessary, by graduated doses. If the serum is given early enough and in sufficient quantity, the response is striking; the throat becomes less sore, the rash fades and the temperature falls within a few hours. The minimum therapeutic dose should be sufficient antitoxin to neutralize 750,000 skin test doses of antitoxin. Measles have been effectively treated by the injection of serum from convalescent patients. The method was first employed by Nicolle and Conseil in 1916. These

workers injected four cubic centimetres of serum into the uninfected children of a family in which the disease existed. Serum from convalescent persons has also been used for preventive purposes during recent years by O'Connor, McNeal, Weaver and others. A passive immunity to measles may be produced by injection of from three to five cubic centimetres of serum or of five to ten cubic centimetres of whole blood from a convalescent, provided the injection be made on or before the fifth day following exposure. This immunity is of less than six months' duration. Similar inoculations, given after the fifth and before the eighth day, will not prevent the disease, but will modify its character. The defects of this method from the prophylactic point of view are that the immunity is of a transient nature and that as convalescent serum is not always to be obtained, the treatment is hardly more than palliative against epidemics. It would seem, therefore, that an effective weapon against measles will ultimately have to be forged in the laboratory. Ferry and Fisher claimed recently to have isolated and prepared a measles toxin, produced by a streptococcus present in the blood of patients in the earlier stages of the disease. It is stated that this organism is agglutinated by the serum of patients convalescent from measles; it produces a toxin which causes the appearance of antitoxic properties in the serum of horses and rabbits. A "skin test" dose of the toxin gives an intradermal reaction in about one-half of those persons who have no history of an attack of measles or who are in the early stages of the disease. The reactions are said to be absent in patients who have been attacked by measles at any time and in convalescents. The work of Ferry and Fisher, however, still requires confirmation by other investigators.

High Blood Pressure.

HUMPHRY ROLLESTON (*The Lancet*, December 11, 1926) finds that patients with high blood pressure may be classified as belonging to one of four groups: (i) Those in whom high pressure exists without cardiac, arterial or renal changes, (ii) those in whom hypertrophy of the left ventricle is discoverable, (iii) those in whom the continued high pressure has produced arteriosclerosis resulting in (iv) chronic interstitial nephritis, cerebral hemorrhage, uræmia and myocardial failure. The diagnosis of high pressure depends solely upon one physical sign—the high reading given by the sphygmomanometer. Hemorrhages in various positions are very rare in uncomplicated conditions and do not occur with vascular changes. Polycythæmia is by no means uncommon in persons with supranormal pressure and in these circumstances usually complicated by chronic interstitial nephritis. Polyuria is a direct result of raised pressure, but the specific gravity may remain normal. It would appear that the metabolic rate re-

mains unchanged unless dyspnoea occurs. Hyperglycæmia is present in a very large proportion of cases of raised blood pressure. A beating leg—the oscillation of the leg when crossed over the opposite knee—may take place when the systolic pressure is above one hundred and sixty millimetres of mercury. It appears in conjunction with a large pulse pressure and is also a familiar phenomenon in aortic incompetence. Pulsation in the lower part of the neck on the right side, simulating the signs of aneurysm, is said to occur only in female patients; it need not be accompanied by arterial sclerosis and is due to sudden kinking of the right carotid artery by the lifting of the aortic arch which in turn elevates the right subclavian artery. Shortness of breath on exertion though frequently classified as an early symptom of high blood pressure is, according to Clifford Allbutt, a serious omen; the patient is suffering from myocardial strain and has come to the last stage of his journey to death; definite arteriosclerosis has usually supervened. The headache of high blood pressure may have a direct causal relationship, as evidenced by the relief occasionally afforded by vasodilators and the practice of lumbar puncture; but many headaches are toxæmic in origin and can be banished by a smart purge. Neurasthenic symptoms are often prominent with high blood pressure and are most commonly due to a coexistent toxæmia. Anginoid pains, occurring on exertion may be the result of high blood pressure *per se* and are considered to be due to stretching of the first part of the aorta; but in all such instances it is manifestly almost impossible to exclude the presence of lesions in the coronary vessels, aorta and myocardium. The author concludes that high pressure alone is not a very potent cause of symptoms. These seem to be due either to toxæmia, arteriosclerosis or to cardiac degeneration. Nevertheless, the discovery of high pressure is viewed unfavourably by insurance companies and is the signal that a search for the underlying cause should be made.

Control of Scarlet Fever in Institutions.

W. COLBY (*Journal of the American Medical Association*, September, 18, 1926) holds that active immunity to scarlet fever can be established in children reacting to the Dick test by suitable injections of scarlet fever streptococcus toxin. The raw toxin has been neutralized with sodium ricin oleate and the whole process of immunization is as a consequence very much safer and more rapid than was formerly the case. In a space of eight days the response of 87% of children under the age of eight years and 77% of older children to the Dick test has been abolished. In the elder children, while immunity is established more slowly, repeated Dick tests at three and six months indicate the development of a progressive immunization.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Lister Hall, Hindmarsh Square, Adelaide, on October 28, 1926, Dr. H. H. E. RUSSELL, the President, in the chair.

Heart Disease and Life Assurance.

DR. A. A. LENDON read a paper entitled: "Heart Disease in Relation to Life Assurance," giving an account of the gradual evolution of the present practice of the Australian Mutual Provident Society with respect to disorders of the heart and of the circulation.

Electrocardiography.

DR. E. F. GARTRELL read a paper entitled: "The Interpretation and Clinical Significance of Certain Electrocardiographs" (see page 528).

Digitalis Compounds.

DR. C. S. HICKS read a paper entitled: "Digitalis Compounds."

Dissecting Aneurysm.

PROFESSOR J. BURTON CLELAND reported the clinical history and *post mortem* findings in a case of dissecting aneurysm of the aorta (see page 538).

Gumma of the Heart.

Professor Cleland also read the clinical history and *post mortem* notes of a case of gumma of the interventricular septum (see page 540).

Pathological Lesions of the Heart and Aorta.

Professor Cleland showed a number of specimens illustrating the commoner and more important pathological lesions met with in the heart and aorta.

Acute Pericarditis with Pus and Fibrin Formation.

The first specimen shown consisted of the lungs and heart of a child who died at the Adelaide Children's Hospital from acute suppurative arthritis due to *Staphylococcus aureus* with secondary pyæmic foci in the lungs, acute pericarditis and septic infarcts in the heart muscle.

Professor Cleland said that acute pericarditis with pus and fibrin formation had been found twenty-two times in a thousand autopsies at the Adelaide Hospital. In many cases (nine out of the twenty-two) the condition had been associated with lobar pneumonia and empyema. In one case there was a peritonitis as well as pleurisy and pericarditis. In another there was meningitis and pericarditis. One case of pericarditis was associated with empyema and bronchiectasis. Extension from a subphrenic abscess due to duodenal ulcer (two cases) or gastric ulcer was a not uncommon cause of acute pericarditis. In one instance an amœbic abscess of the liver gave rise to a subphrenic abscess extending to the pericardium. Malignant disease of the œsophagus might give rise to an empyema and this might be followed by purulent pericarditis. Acute purulent pericarditis was not uncommon in various forms of pyæmia or of pyogenic infection elsewhere. Thus a woman with an iodide eruption on the face had this infected with *Staphylococcus aureus* and finally died from acute pericarditis. In *Staphylococcus aureus* pyæmia from acute osteomyelitis *et cetera* a purulent pericarditis might develop. This had occurred in one instance in the course of puerperal septicæmia.

Adherent Pericardium.

The second specimen consisted of the heart from a girl, *etatis* fifteen years, with an undoubted rheumatic infection. There were recent universal pericardial adhesions and mediastinal adhesions. The interior of the heart showed an old mitral endocarditis with acute rheumatic vegetations along the edges of the mitral and aortic valves due to a recent attack.

Professor Cleland said that a patient probably rarely recovered from a purulent pericarditis. Milder forms of

inflammation, such as gave rise to pleuritic adhesions, probably also sometimes caused pericardial adhesions. The commonest cause of pericardial adhesions was acute rheumatic fever. The two layers of the pericardium might be united throughout or only in places. It was said that pericardial adhesions in themselves did not embarrass the heart unless accompanied by an extension of the inflammatory process to the mediastinal tissue, thus anchoring the adherent pericardium.

Valvular Disease of the Heart.

The next specimen was from a girl, *etatis* fifteen years, with an adherent pericardium. There was a row of vegetations on the mitral valve giving rise to an appearance as if the somewhat contracted valve (from a previous attack of rheumatic fever) had had its edge gnawed by cockroaches. The aortic cusps showed on each side of the *corpus arantii* a semilunar festoon of small warty vegetations.

Professor Cleland said that valvular disease of the heart might be due to acute rheumatic fever, to infection by pyogenic organisms (malignant endocarditis) or to syphilitic disease in the case of the aortic valve. Senile changes might affect the cusps, leading to opacity and eventually calcification and such changes were especially apt to take place in cusps damaged from other causes. Rarely a flap of a cusp might be torn from its attachment. Dilatation of the aorta or of a chamber of the heart might give rise to a relative incompetence.

Acute rheumatic endocarditis (pancarditis) probably affected more or less all the tissues of the heart. The vegetations were minute and warty, forming a fringe a little bit removed from the edge of the cusp and on the surface exposed to the passing blood stream.

Chronic Rheumatic Endocarditis.

Another specimen was from a woman, *etatis* forty-seven years, who had had rheumatic fever three times. There was advanced tricuspid, mitral and aortic stenosis. The mitral orifice was slit-like and would admit merely the tip of the forefinger. Both auricles were much dilated and hypertrophied, but the ventricles were not much increased in thickness.

Another specimen was one of mitral stenosis from a woman, aged twenty-four years, with a history of growing pains in childhood.

Professor Cleland said that chronic rheumatic endocarditis was an aftermath of the acute infection. The cusps affected with the small vegetations of the acute stage underwent gradual fibrosis and contraction. The edges of the cusps might become united causing stenosis or the cusps might contract towards their bases and cause regurgitation or both these mechanical factors might operate together.

Malignant Endocarditis.

In a specimen from a man, *etatis* twenty years, with a history of rheumatic fever three times, the mitral and aortic valves were extensively damaged. There were extensive vegetations extending from the mitral valve upwards on to the wall of the auricle. There was a small red vegetation on one aortic cusp. *Staphylococcus albus* had been grown from the aortic valve, but it was probable that the actual causative organism was missed. There were infarcts in the kidneys.

Another specimen was the heart of a man, *etatis* thirty-one years, with a to-and-fro aortic murmur and elevated temperature, petechiæ in the hands, frequent headaches, diarrhœa and abdominal pain for one week. His blood culture had been sterile. The aortic valve had apparently only two cusps which were very stretched. Their edges were flabby and eroded and had attached pinkish fibrinous vegetations which were not very much heaped up and which extended on to the septal wall. Both cusps were irregularly perforated. The lungs were speckled with petechial spots. The kidneys were very large, weighing three hundred grammes (ten ounces) each and presented a very speckled appearance. The spleen weighed 817 grammes (twenty-seven and a quarter ounces), was moder-

ately firm and retained its shape. It contained two partly absorbed infarcts; it was a type of enlarged spleen met with in *Staphylococcus aureus* infections. There were hemorrhagic infarctions in the lower part of the ileum. *Staphylococcus aureus* was grown from the vegetations and the spleen.

Another specimen was an example of malignant endocarditis of the mitral valve following on empyema after lobar pneumonia in a man, *etatis* thirty-two years. On the aortic cusps of the aortic valve were two large vegetations, one the size of a small marble, the other that of a pea. These were heaped up and nodular. The other valves were normal. The lungs showed partial organization of the old pneumonia and a pneumococcal meningitis was present. Pneumococci had been grown from one of the vegetations.

Professor Cleland said that in twenty out of a thousand *post mortem* examinations malignant endocarditis had been found. Streptococci and *Staphylococcus aureus* were the organisms usually found responsible. The vegetations were usually much heaped up. Occasionally there might be extension of the vegetations from the mitral valve on to the wall of the auricle or from the aortic valve on to the wall of the left ventricle. In some instances the condition had escaped *ante mortem* recognition. In most instances it had been definitely diagnosed or suspected. When murmurs were detected the diagnosis had usually been definitely made. In other cases showers of petechiæ or a persistent irregular temperature had indicated or suggested the presence of this condition. Symptoms of infarctions of the spleen or kidneys were important aids.

Syphilitic Disease of the Aortic Valve.

Another specimen was from a man, *etatis* forty-five years, who suffered clinically from aortic stenosis and regurgitation and who gave a positive response to the Wassermann test. The heart was greatly hypertrophied, weighing with the attached aorta 1,170 grammes (thirty-nine ounces). There was well marked syphilitic aortitis and secondary atheroma was present. The condition had extended to the aortic cusps which were somewhat thickened and contracted, though the regurgitation was chiefly due to dilatation of the aortic ring.

Another specimen was from a man, *etatis* sixty years, who had suffered from indigestion for five years, attacks of shortness of breath for eighteen months and anæmia and cardiac failure. There was syphilitic aortitis and atheroma with considerable stretching of the aortic cusps from dilatation of the ring was present. The aortic cusps themselves were practically not affected by the syphilitic condition.

Professor Cleland said that syphilitic disease of the aortic valve was usually, if not always, an extension from a syphilitic aortitis. It was only in a minority of cases of syphilitic aortitis that this extension to the aortic valves was found. The cusps became much thickened and contracted, leading to regurgitation. Very often the aortic wall had become distended, leading to stretching of the aortic ring. This might occur without involvement of the cusps. Great hypertrophy of the left ventricle might ensue. Aortic disease occurring in a middle aged person who gave no history of acute rheumatic fever, might give rise to the suspicion of its being due to syphilis. This would be supported by a positive response to the Wassermann test.

Syphilitic aortitis occurred more frequently than syphilitic disease of the aortic cusps. Most aneurysms developed on a syphilitic aortitis. In a thousand *post mortem* examinations twenty-one examples of aneurysm had occurred and examination of seventeen other *cadavera* revealed syphilitic aortitis or syphilitic aortic disease. Syphilitic aortitis might be distinguished from atheroma by its frequent occurrence at an earlier age, by the condition affecting all the coats so that the wall was definitely thicker than normal, by the tendency to linear or radiate scarring of the inner surface and by the absence, unless as a secondary change, of atheromatous plaques and calcification.

Aneurysms.

Professor Cleland went on to say that nearly all ordinary aneurysms gave evidence of previous infection with

syphilis. Only occasionally had they met with an aneurysm due to the giving way of an atheromatous area. He showed a sacular aneurysm of the ascending aorta which had ruptured into the mediastinum. The patient had been an inmate of the mental hospital and died on May 12, 1926. His age was given as thirty, but he looked forty. The right pleural cavity had been found full of blood. Examination of sections of the wall of the aorta revealed plasma and round-celled reaction to some extent around the *vasa vasorum*, indicating a syphilitic aortitis. Atheroma was also present.

Hypertrophied Hearts.

Great hypertrophy had been found in the heart of a boy of nineteen years, with red granular contracted kidneys, who died of uræmia.

Professor Cleland had found at autopsies that by far the most common form of "heart disease" was not valvular at all, but due to failure of a hypertrophied heart in consequence of high blood pressure. In some of these cases the hypertrophy was very great. With such a hypertrophied heart the patient might die from its eventual failure to maintain the circulation or the high blood pressure might favour cerebral hæmorrhage. If the kidney condition was responsible for the high blood pressure, uræmia might be the cause of death. He had met with a number of instances in which the kidney lesions were so slight that they could not be held responsible for the hypertrophy of the heart. Such cases were probably the result of a high blood pressure present from childhood and the result of some peculiarity of the individual or they might be the expression of some acquired toxic influence not of renal origin. On the other hand, renal fibrosis could itself be held responsible for the high blood pressure and cardiac hypertrophy. Thus he had seen several examples of fibrotic renal changes of a profound degree occurring below the age of twenty associated with great cardiac hypertrophy, in which it seemed reasonably clear that the kidney was primarily at fault.

Degenerative Changes of the Myocardium.

Another specimen manifested degeneration and thinning of the wall of the left ventricle from coronary atheroma. It was from a male, aged fifty-four years, who died at the mental hospital on July 20, 1926, from heart failure. There was considerable atheroma of the right coronary artery; the anterior branch of the left coronary was occluded by atheroma, as was also the main vessel about 2.5 centimetres (one inch) from its onset. The left ventricle was dilated and hypertrophied on the posterior aspect and on the left side and on the anterior third of the circumference from the septum towards the left the muscle was completely destroyed. The surface was adherent to the pericardium. The endocardium was thickened and opaque, the wall itself bulging slightly and being 1.5 millimetres in thickness.

Professor Cleland said that slow closure of the lumen of the coronary artery or one of its branches might lead to atrophy of those muscle bundles supplied with insufficient nutriment, their place being taken by fibrous tissue. If the block was more sudden, as from an embolus, a portion of the heart wall might be completely deprived of blood and undergo necrosis as a result, appearing as a pale, somewhat yellowish area. The overlying endometrium often suffered so that the formation of a clot projecting into the lumen of one of the ventricles was not infrequent on the damaged tissue.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in conjunction with a meeting of the Section of Neurology and Psychiatry at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on November 25, 1926, Dr. R. J. MILLARD, C.M.G., the President, in the chair.

Chorea.

Dr. J. A. L. WALLACE showed several patients suffering from chorea. Three of these were suffering from chorea of the Huntington type. One of the three was of the second generation of sufferers from the Huntington type

and had a daughter suffering from the same. Other relatives of this patient had already been demonstrated and noted in THE MEDICAL JOURNAL OF AUSTRALIA. Dr. Hogg had referred to one patient in 1902 and Dr. Jones to a patient named Dunkley, a brother of first mentioned patient, who died at Callan Park on January 2, 1921. All were descendants of the Tonkin-Dunkley family. The genealogical tree of this family will be found in THE MEDICAL JOURNAL OF AUSTRALIA of May 5, 1917, at page 376.

Dr. Wallace said that students of Mendelism might be able to correlate the inheritance of this chorea with the Mendelian theory. There were, however, so many complexities in human heredity that it was difficult to show results in any way resembling what was so definite in lower forms of life.

The second patient shown by Dr. Wallace had been in Callan Park for six years and had a partial hereditary history of chorea, including mental instability. Apparently this man was profoundly demented, but on questioning him it could be observed that the dementia was not so profound as it first appeared.

The third patient was a returned soldier in regard to whom it had not been possible to ascertain any hereditary history. He had already been shown at a clinical meeting at Sydney Hospital and Dr. Wallace had brought him to show him along with the other patients.

The fourth patient had choreic movements, but they were more localized and formed an interesting contrast to the condition of the other patients. This woman had an unfortunate domestic life. Slight choreic symptoms had commenced six years previously after the birth of her last child. Her father had died in the Mental Hospital, Gladesville, and suffered from "St. Vitus dance."

Briefly defined Huntington's chorea was a form of chorea which was strongly hereditary and was not related to rheumatic chorea. It consisted of grosser choreic movements, with ataxy and was associated with mental degeneration. The movements were slower than those of rheumatic chorea. There was progressive mental enfeeblement. Histologically there was degeneration of the cells of the cerebral cortex and basal ganglia with neuroglial proliferation and meningeal thickening (Thomson and Riddoch, "Diseases of the Nervous System").

Dr. Wallace passed round a copy of a chart of the Tonkin-Dunkley family, for which he was indebted to Dr. Jones, of Broughton Hall. He had originally drawn up this at the time of the Tonkin-Dunkley case. The patient shown that night was specially marked on the chart.

This patient's age was sixty-one years. She had been admitted to hospital on October 7, 1921. She was married and had five children. One son and one daughter had Huntington's chorea, two sisters had died of this disease. The patient had gradually become affected during several years and had noticed that her gait was becoming unsteady. On admission she had been orientated for time and place, her memory was good, she laughed foolishly at times, but was amenable and quiet. She had suffered from mechanical irritability and her tendon reflexes had been exaggerated. Choreic movements of the extremities had been present. At the time of demonstration she was demented. She suffered from choreic movements of the face and extremities and had difficulty in swallowing.

Hirschsprung's Disease and Ramisection.

DR. R. B. WADE reported a case of Hirschsprung's disease in which treatment had consisted in ramisection. An account of this case was published with an explanation of the technique and the result of operation in the issue of January 29, 1927, at page 137.

The Results of Ramisection.

DR. N. D. ROYLE showed two patients and cinematograph films illustrating the results of treatment by sympathetic ramisection. The first patient had had Raynaud's disease affecting all four extremities for a period of twelve years. The disease was so severe as to interfere with her occupation as a dressmaker. She had suffered acute pain. Ramisection of the right lower limb had been done first. This

was followed by such relief that the patient had returned to hospital to undergo further operative treatment for the other limbs. The result in the lower limbs had been excellent; in the upper limbs the patient had not been so completely relieved. At times the extremities of the fingers became white. Dr. Royle said that this less successful result might be explained in a number of ways. In the lower limb the result had been obtained by simply dividing the abdominal sympathetic trunk between the levels of the third and fourth lumbar nerves. This was a contrast to the extensive operation carried out by Adson, Kanavel and other American surgeons who removed the whole of the abdominal sympathetic ganglionated trunk together with the rami. The removal of the whole abdominal sympathetic trunk was not without effect, as shown by Dr. Wade's more modified procedure in Hirschsprung's disease. In the upper limb it was not possible to divide the sympathetic trunk without giving rise to Horner's syndrome and this should be avoided. Leriche had recently adopted sympathetic ramisection in the treatment of Raynaud's disease, but he divided the rami as they left the "stellate" ganglion. According to the dissection done by Dr. T. K. Potts, this would miss the fibres to the upper cervical nerve roots. It was much more difficult to divide every fibre in the cervical operation and possibly those nerves going to the fingers had been missed in Dr. Royle's case. This would account for the less successful result in the upper limb. Changes in blood pressure might still affect vessels which had been so long the seat of spasm.

The second patient had a left congenital spastic hemiplegia complicated by athetosis. The left upper limb had been carried in a flexed and adducted position and any attempts to use it had resulted in excessive flexion of the wrist and extension of the fingers. This had been relieved by sympathetic ramisection. Function of the hand had very much improved; for example, the patient could pick up objects and use a fork in feeding herself. Supination was much improved also. Dr. Royle said the result in this patient illustrated very well the manner in which voluntary control was inhibited by the sympathetic nervous system; just as in Dr. Wade's case the sympathetic nervous system inhibited movements of the ileum by fixing posture. The same principle was involved in voluntary movements and in movements of other viscera. He had recently operated on a patient with difficulty in extravasating urine. A ramisection had given complete relief.

Dr. Royle also showed a number of moving pictures. In the first film the effects of removal of sympathetic nerves from an otherwise intact goat were shown. The loss of posture was apparent.

He then showed lengthening and shortening reactions in a patient of Dr. Evan Jones. The condition of the patient had been diagnosed by Dr. Jones as postencephalitic rigidity.

Another patient had also been under the care of Dr. Jones and had been operated on by Dr. Poate. Before operation the patient had been unable to walk unaided and could not dress or feed himself, even when assisted in walking he tended to fall forwards, his movements were slow and hesitant. The knee jerks had manifested a slow relaxation of extension. The Babinski reaction had not been present. After operation the patient could run and ascend and descend steps quickly. All his movements gained in speed and amplitude; he had been transformed from dependence to independence.

The result of ramisection in spastic chorea was shown in the next picture. The patient, a girl of nineteen years, had never been able to stand or walk. The pictures showed choreic movements persisting in the upper limbs, face and trunk, but the patient was shown standing and walking. Her walking was steadily improving.

Another patient was a girl of eleven years of age and she was shown in the pictures unable to balance and moving her lower limbs with great difficulty before operation. She had had previous treatment by tenotomy and by partial resection of the peripheral nerves. A post-operative picture was shown illustrating the effects of ramisection on balance and improvement in walking.

A boy of six years and four months was shown illustrating the effects of treatment on a spastic right upper limb. Before operation this patient had literally been unable to tell the difference between one finger and another as regards sensation and he had no movement whatever in the hand. The postoperative pictures showed this patient drinking a glass of milk held in the defective upper limb, shaking hands with it and throwing a ball.

A young woman of twenty-three years who had congenital spastic paraplegia was shown before operation unable to walk except by swinging both limbs with the aid of crutches. The condition of the knee jerks was illustrated and the postoperative picture showed a striking change. This patient was shown walking alone six weeks after operation, although she had never walked before in her life.

Another patient was a girl of seventeen years. She has been able to walk, but the pictures showed her moving the limb practically in block. The slowness of movement and small range of movement were also illustrated before operation. After operation she could be seen walking, bending her knees normally and when lying on her back the improvement in the flexion and extension of the lower limb was very evident.

Another patient was a child of five years and four months suffering with congenital spastic hemiplegia. The film showed the condition of the child on the morning of operation. The improvement in pronation and supination and in the speed of flexion and extension of the fingers the following day was strikingly illustrated.

PROFESSOR A. E. MILLS said that they had had a neurological feast. In commenting on Dr. Wade's case he expressed his approval that Dr. Wade had not claimed that the condition was cured. He referred to a previous discussion before the New South Wales Branch (see THE MEDICAL JOURNAL OF AUSTRALIA, February 7, 1925, page 146) when he had dealt with achalasia of the colon and he thought that the dilatation of the colon was due to paresis of the cells constituting Auerbach's plexus.

Professor Mills continued to speak strongly on the attitude adopted by British observers in regard to the question of the sympathetic innervation of voluntary muscle. He was most emphatic in regard to the facts that had been presented to him. They had seen these patients walk after they had been paralysed for years. No doubt when Dr. Royle arrived in England he would be able to convince them by his admirable demonstrations. It had been suggested that the pain was due to fatigue. It would almost appear as if they did not want to understand.

DR. A. W. CAMPBELL said that Professor Mills had taken the wind out of his sails. In dealing with the question of the sympathetic innervation of striated muscle, Dr. Campbell maintained that everything that Dr. Royle and the late Professor Hunter had set out to prove had been demonstrated most plainly and convincingly. He could not understand how this work could be disregarded.

Dr. Royle replied briefly.

Conversion Hysteria.

DR. RALPH NOBLE showed a single girl of sixteen years. She had suffered from pleurisy and pneumonia in January, 1926, followed by empyema for which she was treated in a general hospital in Sydney for a period of ten weeks. After recovering from this illness she had been unable to use the right hand or the right lower limb. She was discharged from hospital unable to walk without the aid of a stick and was subsequently readmitted to the same hospital where she was under observation and treatment for a further period of six weeks. There was still no improvement and the orthopaedic surgeon who saw her in consultation advised an operation on the hip joint. The friends would not agree and she was discharged from hospital without relief.

She had been admitted to the Lewisham Hospital on July 17, 1926, complaining of inability to walk without the use of a stick and of acute pain in the right hip joint.

On examination the right leg had been abducted, the knee joint flexed and the foot extended. Any attempt to move the leg had been followed by severe protests of pain. The cranial nerves had all been normal, the deep

reflexes were very active, the plantar reflexes were flexor, there was no clonus. The condition had been regarded as an hysterical one and was treated accordingly. Although the patient protested strongly, she was made to stand out of bed without any support and in a few minutes she was able to take a few steps. Further reeducation day by day had soon led to a complete recovery.

The cause of this patient's hysterical symptoms was to be found in her unhappy domestic life, the illness being a means of retreat from these conditions. The girl was living with her grandmother because of the cruelty of her stepmother. The stepfather was in the habit of drinking to excess. The girl was anxious to avoid returning to her own home.

Hysterical Fugue.

Dr. Noble's second patient was a male, aged forty-five years, a widower, with seven children. He had reported at the Psychiatric Clinic at the Royal Prince Alfred Hospital on October 27, 1926, with a history that on the Tuesday of the previous week he left his home for work and remembered nothing more until he found himself a few hundred yards from the home of some old friends at Ingleburn, about twenty-seven miles from Sydney, on Friday of the same week. He had no recollection of what had occurred during this time.

On examination the patient was seen to be in a weak physical condition with a mouth full of very septic teeth. There had been no organic nervous disease present, the blood had yielded no response to the Wassermann test, there was no history of recent alcoholic excess, nor of frequent potus.

The condition was one of hysterical fugue and was rather rare, because the patient did not give any history of previous hysterical symptoms. On inquiring into the man's domestic life it had been found that his wife died in an accident some two years previously, leaving seven children and the patient had had a considerable amount of anxiety regarding their upbringing. It was to be noted that the patient at the end of his fugue found himself near at hand to old friends who were well known to himself and his late wife and that no harm came to him during his period of amnesia.

DR. S. EVAN JONES also showed a patient who was suffering from an hysterical fugue. This patient's history is published on page 541.

Cerebral Tumour.

DR. RALPH NOBLE reported the case of a single girl, aged twenty-six years, who was first seen at the Psychiatric Clinic at the Lewisham Hospital in August, 1926. She had complained of dizziness, noises in the head, partial loss of vision, vomiting and difficulty in walking. She had not previously received any medical advice. On examination the right pupil had been sluggish in its reaction to light and there was ptosis at the right eye; there was also some loss of sensation on the right side of the face and paralysis of the sixth and eighth nerves on the right side; there was difficulty in swallowing. The knee jerks had been equal, the plantar responses were flexor and there was no ankle clonus. There had been some loss of power on the right side of the body, the gait was unsteady, the patient deviating to the right. There was no Rombergism and no spasticity of the limbs. There was no disturbance of the bladder. The discs showed marked papilloedema.

A diagnosis of a tumour in the cerebello-pontine angle had been made.

The patient had been admitted to Lewisham Hospital on September 11, 1926. Bárány's tests had been carried out by Dr. W. A. Dunn and showed that the vestibular nerve on the right side was destroyed. The blood serum had not yielded a response to the Wassermann test. X ray examination of the skull had revealed no bony abnormality. Dr. J. Flynn had reported that there was double papilloedema present with three diopters of swelling.

Dr. R. Flynn and Dr. J. McPhee had been asked to see the patient in consultation and had decided to attempt to remove the tumour. The operation had been carried out in two stages, the incision being made from one mastoid

process to the other in order to allow a large area of bone to be removed in the occipital region.

The lateral ventricle had been punctured and a large amount of clear fluid removed which on examination proved sterile. There was no increase of cells in this fluid. Twenty-one days later the second stage of the operation had been carried out through a similar incision and an attempt was made to remove the tumour; but the patient's condition did not allow of the operation being completed and the patient was returned to the ward in a rather exhausted condition. She died on the same evening.

The following morning *post mortem* examination was carried out and a loculated cyst had been seen apparently growing from the right Gasserian ganglion. The cyst had eroded the petrous portion of the temporal bone and proceeded to the posterior fossa where it lay in the cerebello-pontine angle. In size it was about that of a small orange.

The specimen had been examined by Dr. C. H. Shearman who reported that the growth was a neuro-fibroma. It apparently arose from the fifth nerve, whereas nearly all tumours in this region arose from the sheath of the eighth nerve. Hence the tumour was a rare one in so far as its origin was concerned.

Dr. M. R. FLYNN referred to the work of Macphree on bilateral decompression. Macphree used regional anaesthesia, but often employed intratracheal anaesthesia when it was desired to remove consciousness. He referred to a patient who had right sided decompression performed. He had been returned to bed quickly in a very bad state. After ten days the patient felt and looked very much better and all his pain was gone. Eleven or twelve days later the skull was again opened and during the removal of a cyst, the cyst burst. The patient died within a few days. It appeared that a large cystic mass had expanded the frontal fossa. The pressure of the tumour had given rise to pain. The signs were loss of cranial reflex, trigeminal neuralgia and proptosis. He had thought that the tumour had originated in the Gasserian ganglion.

Juvenile General Paralysis.

Dr. S. MINOGUE showed a male patient, aged twenty-four years, a single man and quarter cast aboriginal. He was suffering from typical dementing general paralysis of the insane. He was profoundly demented; he had no memory; he was wet and faulty in habits. His speech was slurring; there was a fine tremor of his lips and tongue, whilst there was a generalized weakness of his whole body; he could not stand without support. His pupils were unequal and both showed the typical Argyll-Robertson reaction. His blood yielded a reaction to the Wassermann test. His cerebro-spinal fluid manifested the four typical reactions found in general paralysis of the insane, namely, a reaction to the Wassermann test, an increased number of cells (14), a globulin reaction, a paretic curve in the colloidal gold reaction (555443210).

From the limited history obtainable it appeared that he was perfectly well until three years previously, when he fell from a tree. Since then he had become "queer" mentally and had become steadily worse. He had had a fit two to three months before his admission to Gladesville in June, 1926.

Dr. Minogue said that it was difficult to decide whether the condition of this patient was acquired or congenital. The evidence pointed to the fact that he was quite well until he was twenty-one. This would seem to indicate an acquired type of infection, for most congenital general paralyses showed evidence of their disease long before that age. Although there was no proof of the fact, he had probably acquired his infection like many other aboriginals early in life. The infection was dormant and had been lighted up into activity by trauma to his head. Sir Frederick Mott insisted it was the starting point of many cases of general paralysis of the insane. He was thus an exceptionally young patient to be suffering from this disease.

Pathological Investigation.

Dr. OLIVER LATHAM reported the results of an investigation into two cases of sudden death. This report has been published in the issue of January 22, 1927, at page 121.

ANNUAL MEETING.

THE ANNUAL MEETING OF THE TASMANIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on February 12, 1927, Dr. E. BETTINGHAM-MOORE, the President, in the chair.

ANNUAL REPORT.

Dr. A. W. SHUGG, the Honorary Secretary, presented the annual report as follows:

The most important event of the year has been the formation of two divisions within the Branch. This has been followed by much enthusiasm and success in the Northern Division in the form of clinical meetings.

Post-Graduate Work.

A very successful series of post-graduate lectures and clinics were given by Drs. Hamilton Russell, Sewell and Whitaker. This benefit has been made possible to members by the successful working of the honorary staff in conjunction with the Superintendent and resident staff of the Launceston Hospital. The Branch gratefully acknowledges the debt due to the gentlemen who travelled so far to deliver these lectures and to Dr. Newell for his successful organization.

Public Hospital.

A strenuous endeavour was again made to overcome the deadlock in reference to the General Hospital. It was again brought to an abortive conclusion by the Board re-appointing the present Superintendent for a further period of three years, increasing the salary and making the position again part time.

Chief Health Officer.

The Council appointed a subcommittee to interview the Minister for Health, deploring the fact that Tasmania had no chief health officer and urging that the appointment be made as soon as possible. The Council are of opinion that a part time appointment would not be satisfactory.

Clinical Evenings.

Several interesting papers were read during the year, but the attendance at meetings was most unsatisfactory.

Attendances at Meetings.

Eleven Council meetings were held during the year with an average attendance of 5.2. Seven Branch meetings were held at which a quorum was present, with an average of nine.

Election of Office-Bearers.

The following office-bearers were elected for the ensuing year:

President: Dr. G. H. Hogg.

President-Elect: Dr. G. Sprott.

Vice-President: Dr. F. W. Fay.

Members of Council: Dr. A. W. Shugg, Dr. H. W. Sweetnam, Dr. G. E. Clemons, Dr. T. C. Butler, Dr. J. Ramsay.

Honorary Secretary: Dr. E. Bettingham-Moore.

Honorary Treasurer: Dr. E. A. Rogers.

President's Address.

Dr. E. BETTINGHAM-MOORE then read his presidential address (see page 527).

MEDICO-POLITICAL.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on February 21, 1927, Dr. H. V. FOXTON, the President, in the chair.

Hospital Policy.

Dr. E. SANDFORD JACKSON explained the various aspects of the hospital policy. He moved and Dr. EUSTACE RUSSELL seconded:

That the hospital policy enunciated by the document formerly circularized to the members of the Branch be adopted as representing the views of members in all matters covered thereby.

After discussion the motion was put to the meeting and carried.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Allen, Stuart Douglas, M.B., Ch.M., 1924 (Univ. Sydney), Boulevarde, Strathfield.

Correspondence.

THE STANDARDIZATION OF OBSETRICAL TREATMENT.

SIR: In the journal dated February 5, 1927, you published an account of the proceedings of the Obstetrical and Gynaecological Section of the Victorian Branch of the British Medical Association held in October, 1926. These consisted of a report presented by Dr. Tate Sutherland upon the standardization of obstetrical treatment.

It is now some twenty years since I first became acquainted with the science and art of midwifery and perusal of this report awakened many memories of student days. I was set a-wondering how much advancement we can measure in the last fifty years. I recognize fully and unceasingly advocate the value of antenatal supervision. The extension of this I count a real step forward, a step towards the recognition of the abnormal in its infancy. It is, like most other advances in medicine, one of prevention. We have also a wealth of biochemical investigations, many of which are more interesting than clinically valuable. There has also been a *sub judice* extension of the scope of Cæsarean section. Apart from these every procedure suggested as a standard treatment was practised by our grandfathers. This may add to their value since they have stood the eliminating test of experience.

To emphasize my point I have paralleled extracts from the above report with quotations from a "System of Midwifery" by William Leishman, published in 1873, fifty-four years ago.

Leishman was Regius Professor of Midwifery in the University of Glasgow, his language is florid in the Victorian fashion, but the principles enunciated are identical with those of the report. I am aware of the danger of avulsing a statement from its context, but I have been careful to avoid an unjust or misleading extraction.

"STANDARDIZATION OF OBSETRICAL TREATMENT,"
OCTOBER, 1926.

Description of the administration of the antenatal clinic.

"We believe that the keynote of successful treatment in the normal case is a policy of masterly inactivity."

"The students are taught that the woman in normal

"A SYSTEM OF MIDWIFERY,"
WILLIAM LEISHMAN,
1873.

"The judicious management of a case of labour may be held to include certain preliminaries in regard to which women, and more especially *primipara*, often require advice."

"It is fortunate that, in a very large proportion of all cases, the various stages of labour are effected by the unaided efforts of Nature, in a manner which renders any 'assistance' on the part of

labour is far better off and far safer if she has no doctor at all than if she has one that interferes unnecessarily. . . ."

"Time is always allowed for the uterus to expel the placenta into the vagina by its own efforts."

Indication for the use of forceps:

"Impending or actual foetal distress."

The necessary conditions for the use of forceps:

1. "Favourable position and presentation."

2. "Cervix should be fully dilated . . ."

3. "Membranes should be ruptured."

4. "Absence of uterine inertia."

5. "Bladder and rectum should be empty."

6. "Maximum diameter of the head should be past the brim."

7. "No insuperable obstruction should be present."

the accoucheur . . . quite unnecessary."

"If we do not feel that the uterus is firmly contracted behind the symphysis, we should now attempt by friction over the fundus to excite it to contraction; if, on the other hand it is quite firm, the case should be left absolutely to Nature."

"The stethoscope should be employed from time to time during the course of a tedious labour, to ascertain the vigour and vitality of the foetus . . ."

1. "Vertex: . . . It is necessary that the actual position of the head be made out with perfect certainty."

"Breech: . . . in preference to dragging on the neck, apply the forceps without delay to the sides of the child's head, and thus complete delivery."

2. "An essential condition is, according to all authorities, complete dilatation of the os . . ."

3. ". . . and it is therefore absolutely necessary that the membranes be ruptured."

4. No reference.

5. ". . . we must be sure that neither the bladder nor rectum are distended . . ."

6. No reference.

7. "Having satisfied ourselves as to the position of the head and that conditions exist which warrant the performance of the operation . . .," Leishman concludes his chapter on forceps: "We would conclude this chapter with a single word of caution to the young practitioner who has attained a certain amount of confidence and skill in the use of the instrument. It is to beware lest this should lead him to too frequent and unnecessary application of it. Above all, let him remember that no mere question of time, or of his own convenience, can ever be a sufficient warrant for operative interference. No operation is without risk, and nothing, therefore, short of a conscientious conviction that he is about to act in the interests of mother or child can ever absolve him from the responsibility which attaches to him in virtue of the position which he occupies."

"Of 2,459 vertex presentations, 64 were persistent occipito-posterior."

"The treatment of pre-eclamptic toxæmia is commenced without delay . . ."

Eclampsia.

Principles of treatment:

1. Elimination.
2. Starvation.
3. Non-radical intervention with pregnancy and labour.

"Chloral . . . are sometimes given."

"Venesection has been done for patients with a very high blood pressure."

Hyperemesis Gravidarum.

"Therapeutic abortion was necessary in only two cases out of thirty-eight."

Face Presentations.

"We always adopt conservative treatment in these cases."

Breech Presentations.

" . . . traction with the finger in the groin is used."

"When the head, therefore, is placed in the third position, the labour may be terminated in two ways, either by rotation into the second position or by the forehead passing under the pubis. As the former is the rule and the latter a rare exception . . ."

"The earliest stage at which the question of treatment may offer itself for our consideration, is when the symptoms during pregnancy are such as to cause serious apprehension of an impending explosion . . ."

1. "In every case, the function of the bowels should be carefully regulated, but purgation, although strongly recommended by some . . ."

2. No reference.

3. " . . . we should avoid . . . above all, any unnecessary manipulation or digital examination."

" . . . although we recognize the importance of speedy delivery, we must be extremely careful in adopting operative means for accelerating the process . . ."

"The hydrate of chloral is another anæsthetic agent, which has of late been strongly recommended."

"Perhaps in some quarters the rejection of the lancet has been too absolute."

"If we admit that throbbing carotids . . . are exceptional symptoms warranting blood letting . . ."

"The conclusion that Cazeaux and others reached, that under no circumstances are we justified in inducing premature labour . . .; but to this we cannot assent, although we admit that the cases that would warrant the operation are of extremely rare occurrence."

"In face presentations we believe the safest rule for our guidance is to avoid interference as much as possible."

" . . . many cases will terminate happily without any aid afforded."

"By the finger alone introduced over the groin, the breech may be brought down under the pubic arch."

The Transverse Lie.

"In the remaining eight cases (out of nine) a version was performed."

"The treatment, according to almost all authorities, which is most applicable to transverse presentations, is the operation generally known as turning . . ."

Trial of Labour.

"In border line cases of disproportion, . . . patients are always given a trial of labour."

" . . . we must in the first instance decide whether . . . we should give Nature a chance. In the minor degrees of pelvis deformity, it is always proper to do so."

Placenta Prævia.

"Six were treated by podalic version . . . Four were treated by vaginal-plugging, rupture of the membranes, pituitrin."

"The operation of turning . . . is that to which most modern authorities give the preference in the treatment of cases of placental presentation."

"In a large proportion of cases in which the os is as yet undilated, the only justifiable mode of procedure is by plugging."

"The puncture of the membranes is the first thing to be done in all cases of flooding sufficient to cause anxiety before labour."

"A full dose of ergot may be administered, with the view still further of ensuring efficient contraction."

Induction of Labour.

"During the year nineteen inductions were induced by using the rectal tube."

"The process which, in the opinion of most operators of the present day, is to be preferred . . . is the introduction within the uterus of an elastic catheter . . ."

"Eight were cases of contracted pelvis."

"As the necessity for this proceeding arises . . . from conjugate contraction of the brim . . ."

"Eight were for toxæmia of pregnancy."

"It has been proposed, with a view to obviating eclampsia and its dangers, that premature labour should be induced. Tarnier recommends that this should be done before the symptoms become urgent."

"One patient suffered from pulmonary tuberculosis." "One patient suffered from cardiac failure."

"When a woman, towards the end of pregnancy, is affected by a serious disorder, which apparently places her life in immediate jeopardy," "In dropsical effusions . . .," "Certain cases of cardiac disease," " . . . but we may mention dropsy of the amnion, fibrous or other tumours, albuminuria, convulsions and mania . . ."

I have not made this comparison in a spirit of criticism or as a pessimistic diatribe, but to give reason for a query. Here at an interval of fifty years we find identical advice given and treatment recommended, but we have an unaltered mortality. In Leishman's day more grave operative procedures such as embryotomy were undertaken, Cæsarean section though seldom done showed a mortality of 85% and Listerism was as yet a vision. Today we are practising the same methods, have a generous knowledge of

infectivity and pyogenic disease and above all the heritage of a matured antiseptic and aseptic technique.

Why, then, is the mortality stationary? The cause is I think fourfold: (i) The protests of the patient, (ii) the engagements of the *accoucheur*, (iii) the ease of chloroform, (iv) the lure of "Lysol." Common knowledge removes the necessity of stressing the fact that the patient's protests and pressure upon the attendant's time are frequent excitants of premature interference and hasty delivery. The demand for anaesthesia is often too great to resist. Chloroform, however, delays labour and we are confronted with the alternatives of prolonging anaesthesia until unaided birth occurs, of artificially hastening delivery or allowing the patient to resume consciousness undelivered. The second is very naturally chosen. There is no doubt that our forebears were more reluctant to interfere with natural processes having a lively and righteous dread of puerperal pyrexia.

It may be fairly assumed that if the modern *accoucheur* apprehended any additional risk attendant upon interference, he would be strong-minded enough to resist his patient's demands and sufficiently self-sacrificial to abnegate his own affairs in favour of safety. He does not do so because he is under the lure of "Lysol." By this cacophonous phrase is meant the application of antiseptic technique to obstetrical practice.

With the false security engendered by the possession of a bottle of "Lysol" and a sterilizer the *accoucheur*, especially the young one, hastens delivery in the interests of his patient or himself. His personal and instrumental preparation may be aseptic, but the area of operation is not.

For a mere dilatation of a cervix a gynaecologist very rightly will demand full surgical technique, whereas the obstetrician will effect a forceps delivery through and from a germ-laden vagina. At times this may be inevitable, but more often such assisted deliveries will end naturally if afforded a chance to do so.

Therefore, I think we may find the cause of the disappointing failure of Listerism to reduce the puerperal mortality in the fact that, allured by the ritual of asepsis, the modern obstetrician will interfere with greater readiness than did his grandfather, forgetting or maybe chancing, the septic track in which he chanced.

Thus the advantages of asepsis are counterbalanced by the false confidence it gives and the maternal mortality remains.

Yours, etc.,

J. B. DAWSON, M.D., F.R.C.S.

8, King William Street, Adelaide,
February 18, 1927.

PERNICIOUS ANÆMIA OR SPRUE.

SIR: I have read with great interest the report by Dr. S. O. Cowen which appeared in THE MEDICAL JOURNAL OF AUSTRALIA of December 4, 1926, concerning a case in which the differential diagnosis between pernicious anæmia and sprue presented considerable difficulties.

For several years in conjunction with Lieutenant-Colonel F. P. Mackie, I.M.S., and others I have been investigating this problem in Bombay and as the final report¹ has not yet been published our conclusions may prove of assistance to Australian observers.

The blood of 56% of our cases showed a colour index above 1 when first examined. Many of them presented the classical sprue syndrome and in this group there was naturally no reasonable doubt as to the diagnosis. Difficulty was only experienced when the alimentary features were atypical or where the patients came under observation during the long latent interval between relapses when the typical apyrexial diarrhoea characterized by bulky, gaseous, pale coloured stools was absent.

In this group the most reliable clinical features in the differentiation from pernicious anæmia consisted of emaciation or a history of marked loss of weight, the passage of bulky stools especially in the morning, bouts of abdominal distension most marked in the evening and a complete absence of any neurological features suggestive of subacute combined degeneration of the cord. Abdominal distension is not uncommon in latent sprue and is especially related to the carbohydrate moiety of the diet.

Laboratory aids to diagnosis consisted of fat analysis of the faeces, the fractional test meal—especially estimations of the total and inorganic chlorides—and the Van den Berg reaction. *Monilia ashfordi* was found to occur with equal frequency in normal and sprue stools; in consequence its presence was of no significance.

Even in latent sprue there is definite limitation on the part of the intestinal mucosa to absorb fat. While a patient is restricting his fat intake, this may not be obvious, but if the fat content of the diet is increased the stools become more bulky and chemical analysis will show a marked increase in the total fats compared to that observed in the normal individual. Our findings in thirty-six consecutive cases through all periods of the disease during and after treatment showed that fat averaged 47.1% of the dried faeces. Of this 7% represented neutral fat, 17.3% consisted of free fatty acid, while 22.8% was in the form of combined fats. Defective fat absorption is not a feature of pernicious anæmia.

The blood in sprue may show the characteristics of an aplastic, a pernicious or a secondary anæmia and the bone marrow may present corresponding changes. In our series in the long bones hyperplasia of the red marrow of moderate grade intensity as well as of the extreme type seen in pernicious anæmia was met with, while complete aplasia with the production of gelatinous, greenish marrow bereft of erythroblastic elements was also observed. On the other hand evidence of intravascular hæmolytic was very limited. It is now generally accepted that in hæmolytic anæmias the hæmoglobin is converted by the cells of the reticulo-endothelial system into bilirubin and hæmosiderin. In pernicious anæmia both these products of hæmolytic are markedly increased, but in sprue the deposition of hæmosiderin in the liver and kidney is distinctly limited, while the Van den Berg reaction is frequently negative. Thus out of sixteen consecutive cases in our series nine gave indirect Van den Berg readings of under 0.5 units and seven exceeded this figure. Only one serum, however, registered more than 1.3 units and this patient suffered from malignant tertian malaria as well as sprue. His serum gave a reading of 2.0 units indirect reaction and a delayed direct reaction as well. The immediate direct reaction in all cases was negative. In pernicious anæmia on the other hand the indirect Van den Berg readings are high though occasionally during the quiescent periods low or negative result may be obtained.

The fractional test meal was found to afford most important data from the standpoint of differential diagnosis. In pernicious anæmia achlorhydria exists and here the condition appears to be one of true *achylia gastrica* due to a secretory defect. An analysis of the total and free acid curves in a consecutive series of twenty-six cases of sprue demonstrated that four were hyperchlorhydric, seven were normal, eight were hypochlorhydric while the remaining seven were achlorhydric in type. Observations on the total chloride, inorganic chloride and active hydrochloric acid were also made. In the hyperchlorhydric group the total chloride curve was satisfactory while the inorganic chloride curve was found to rise as the active hydrochloric acid curve decreased. In the achlorhydric cases the total and inorganic chloride curves approximated closely. If the generally accepted view be correct that the total chloride curve affords an index to the secretory functions of the stomach and the inorganic curve mainly represents hydrochloric acid which has undergone neutralization by sodium bicarbonate, it follows that in the achlorhydria of sprue, hydrochloric acid is being secreted efficiently while its apparent absence from the gastric content is dependent on neutralization by alkaline fluids derived from the duodenum and elsewhere.

¹ A preliminary report on researches in sprue was published in the *Indian Journal of Medical Research*, Volume XIV., Number 1, July, 1926.

Our observations confirmed those of Scott regarding a lowering of the ionic blood calcium in sprue, but until more is known concerning these estimations in pernicious anaemia, Vines's method cannot assist in the differential diagnosis.

Experience in Bombay convinced us that sprue and pernicious anaemia were distinct clinical entities, that most cases with a blood picture resembling pernicious anaemia were in reality sprue and that modern biochemical investigations afforded data of great value in the diagnosis of doubtful cases. Most of our patients had at some time suffered from *Laverania malaria* or *Plasmodium vivax*, but unlike Goodall and Gullard we were never satisfied that uncomplicated malaria could give rise to a blood picture and bone marrow resembling pernicious anaemia.

Yours, etc.,

N. HAMILTON FAIRLEY.

The Walter and Eliza Hall Research Institute,
Melbourne,
February 28, 1927.

University Intelligence.

MACDONALD PRESENTATION FUND.

THE following subscriptions to the Macdonald Presentation Fund have been received since the publication of previous lists.

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Total	£245	1	6

On Thursday, March 24, 1927, in the presence of a numerous gathering, Professor Welsh in a happy little speech presented Macdonald with a cheque for £200. The remainder of the sum contributed after the auditors have submitted their report will be placed to his credit in the Government Savings Bank of New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

QUANDIALLA, NEW SOUTH WALES: Subsidized Doctor.

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Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Hon- orary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia.
WESTERN AUS- TRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVI- SION): Honorary Secretary, Wellin- gton.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

- APRIL 11.—New South Wales Branch, B.M.A.: Organization and Science Committee.
APRIL 12.—Tasmanian Branch, B.M.A.: Branch.
APRIL 12.—New South Wales Branch, B.M.A.: Ethics Committee.
APRIL 14.—Victorian Branch, B.M.A.: Council.
APRIL 14.—New South Wales Branch, B.M.A.: Clinical Meeting.
APRIL 19.—Tasmanian Branch, B.M.A.: Council.
APRIL 19.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
APRIL 20.—Western Australian Branch, B.M.A.: Branch.
APRIL 22.—Queensland Branch, B.M.A.: Council.
APRIL 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
APRIL 27.—Victorian Branch, B.M.A.: Council.

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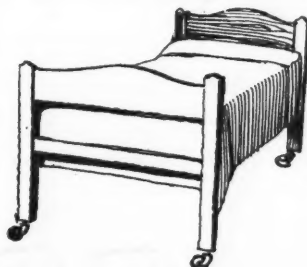
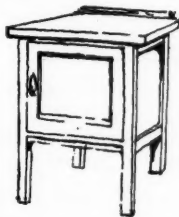
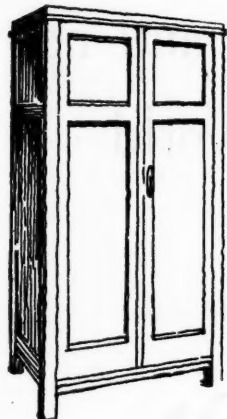


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